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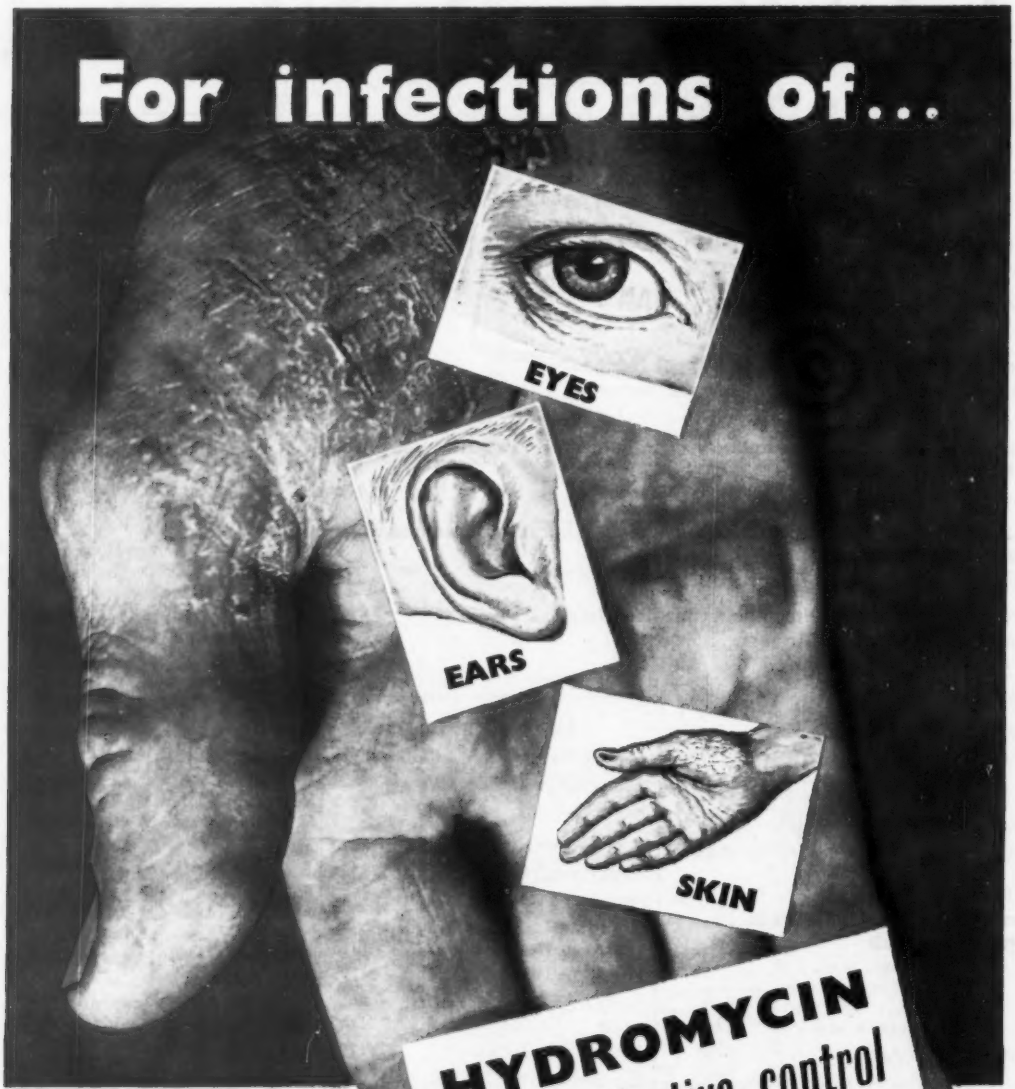

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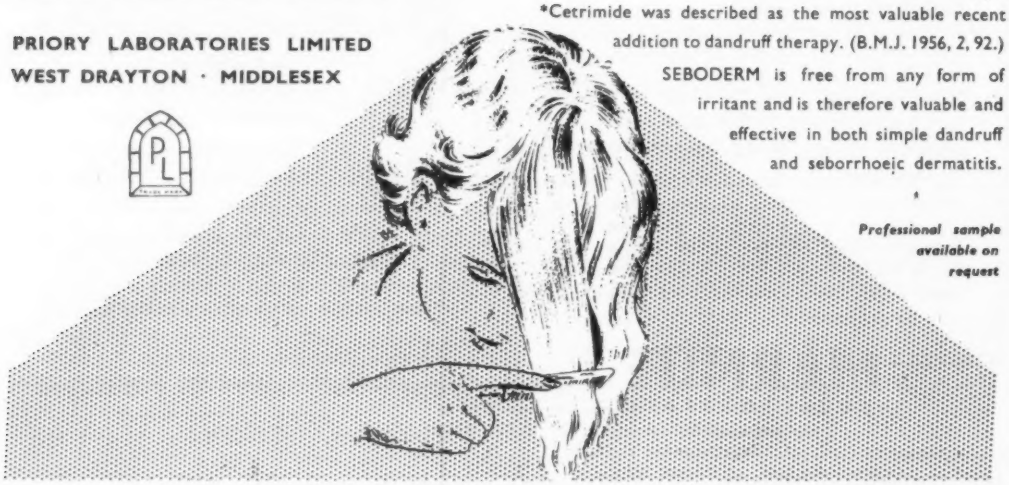

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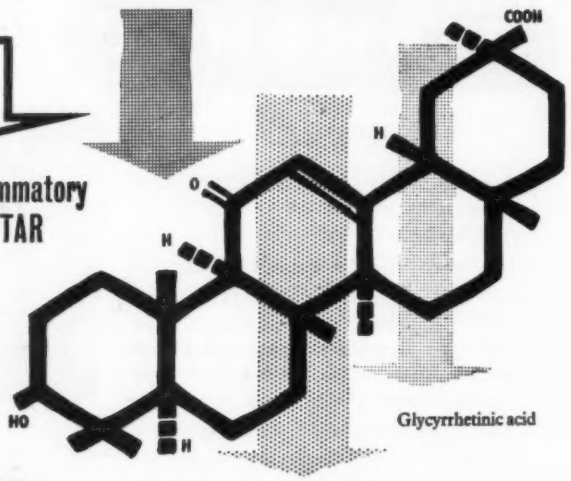

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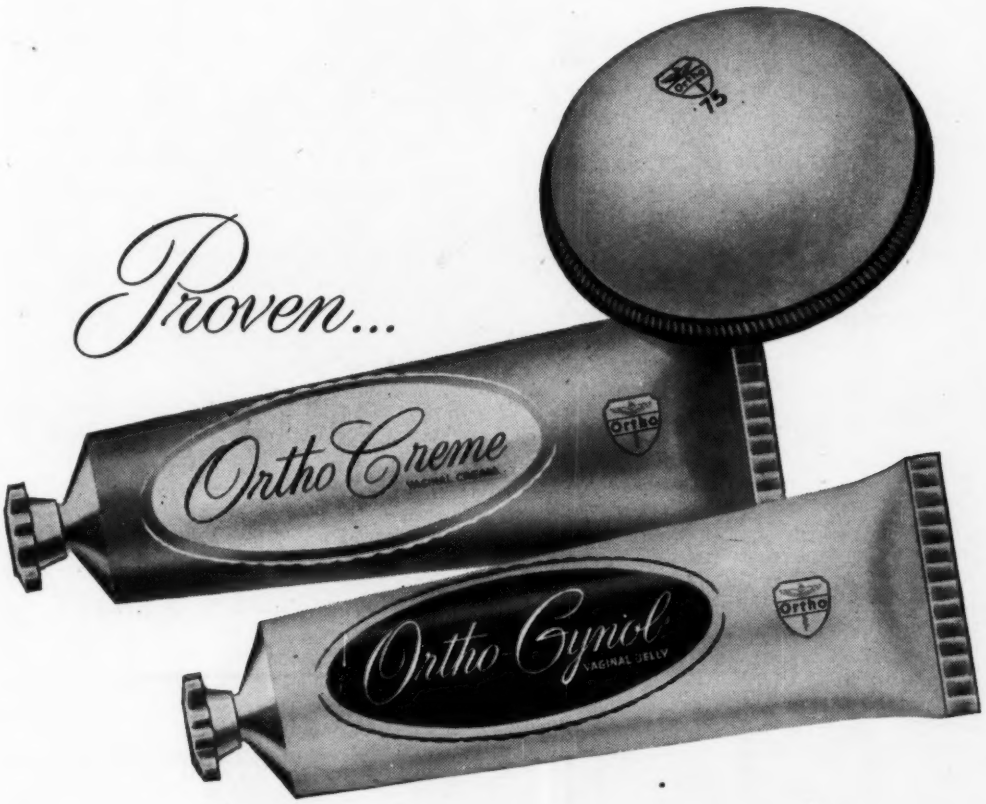

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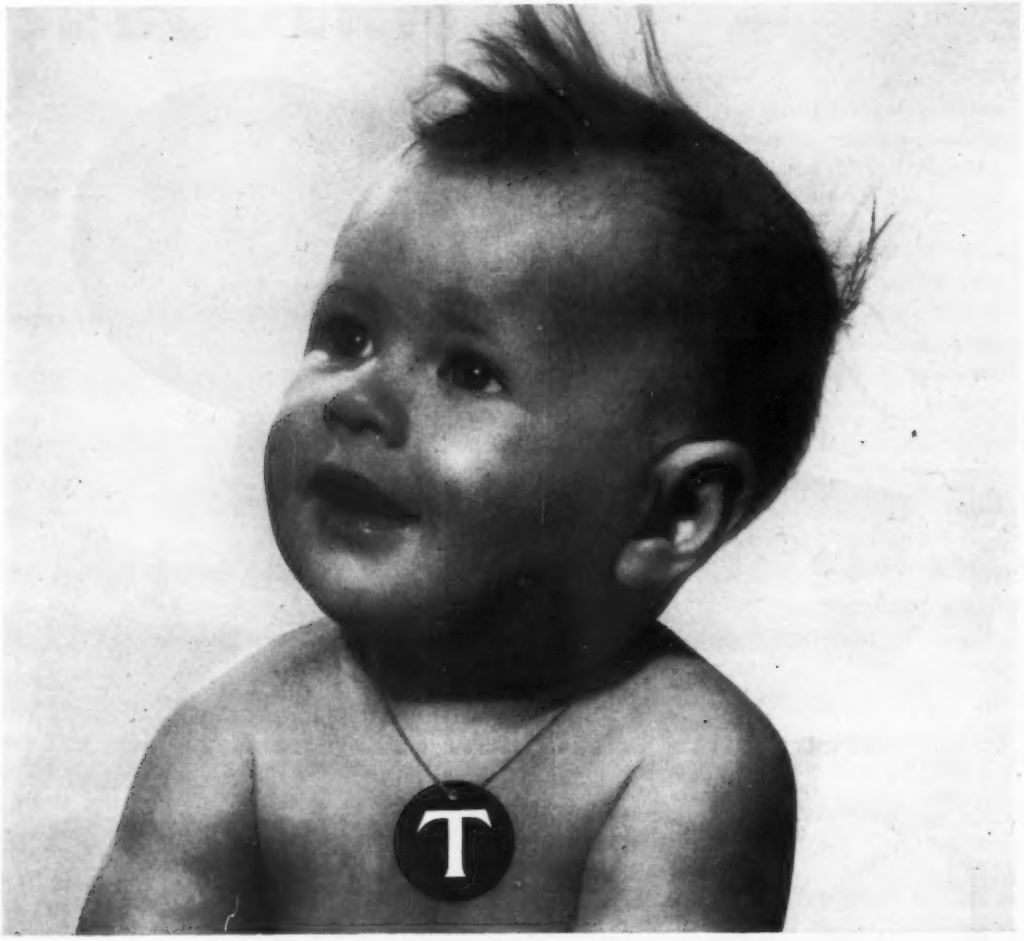

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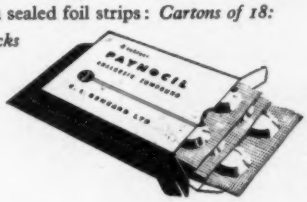

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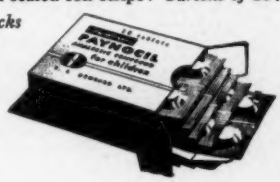


601/65(68)/2

C. L. BENCARD LTD. PARK ROYAL, LONDON, N.W.10

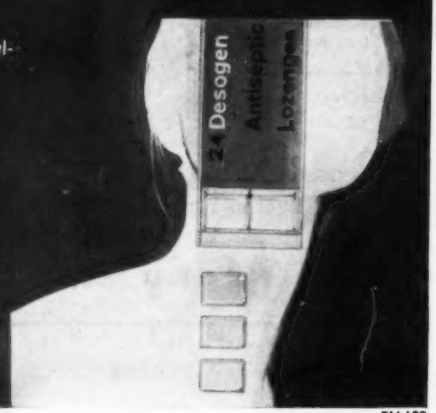
Desogen lozenges

Regd. Trade Mark

for the prevention and treatment of infections of the mouth and throat

Each Desogen lozenge contains 0.5 mg. of (dodecanoyl-N'-methyl-aminoethyl)-(phenyl-carbamyl-methyl)-dimethylammonium chloride.

In Containers of 24 tablets



Geigy

Geigy Pharmaceutical Company Ltd., Manchester 23

12

PH.108

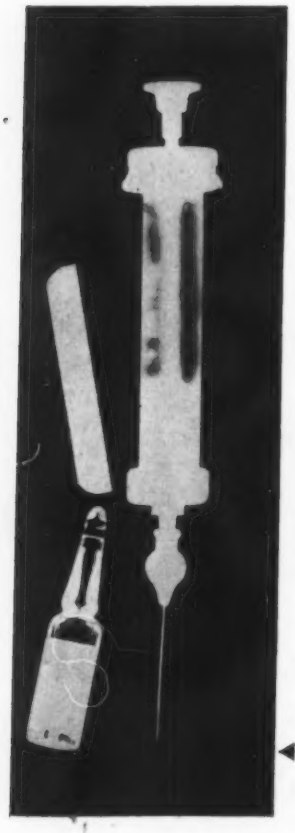
The first Water-soluble chloramphenicol

By preparing the water-soluble sodium salt of chloramphenicol succinic ester CARLO ERBA have finally solved the therapeutic problem of parenteral (*intramuscular, intravenous, intraspinal*) and topical (*aerosol, intrabronchial, intrapleural,* etc.) administration of this antibiotic.

KEMICETINE Succinate

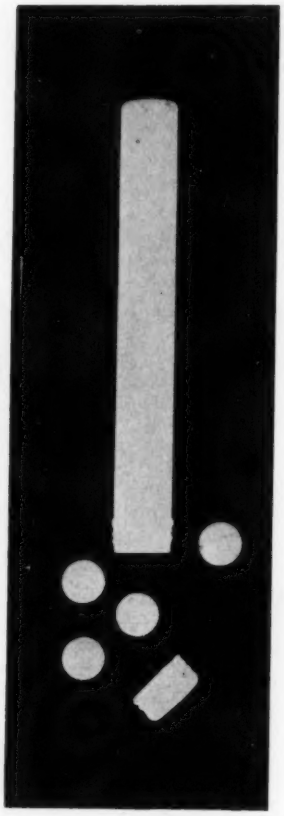
CARLO ERBA MILANO

CARLO ERBA MILANO



in cases of spasmodic dysmenorrhoea

Prophylactically, a course of tablets starting a day or two before the expected flow will give



complete relief in most cases. BUSCOPAN is a completely safe spasmolytic giving rise to none of the unpleasant side effects normally associated with drugs of this nature.

BUSCOPAN gives rapid relief from pain associated with Spasmodic Dysmenorrhœa. When pain is severe, an intramuscular injection followed in four hours by oral administration *(2 tablets three times a day)* will give prolonged relief.

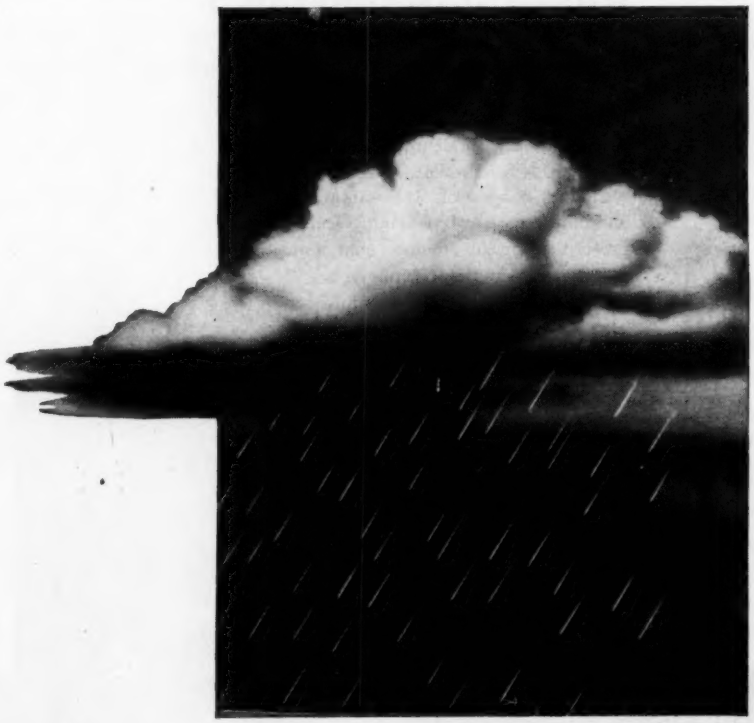
Other indications

Gastric or duodenal ulcer, spasmodic disorders of the gastro-intestinal tract, biliary colic and delayed relaxation of the lower uterine segment.

BUSCOPAN*

Hyoscine-N-Butylbromide

Manufactured and distributed in the U.K. by Pfizer, Ltd., Folkestone, Kent, for
C. H. Boehringer Sohn, Ingelheim am Rhein.
Registered Proprietors of the Trade Mark. * *Regd. Trade Mark.*



RELEASING the surplus

In cardiac oedema and other conditions where excess fluid accumulates in the tissues, DIAMOX acetazolamide can be relied upon to release the surplus promptly and safely. DIAMOX induces diuresis in a novel and highly efficient manner—by inhibiting the enzyme carbonic anhydrase. A single dose will induce a powerful diuretic response, persisting for six to twelve hours—and in many cases of congestive heart failure DIAMOX *alone* is capable of maintaining the patient oedema-free. As clinical experience of DIAMOX grows, more and more applications are revealed—including glaucoma, toxaemias and oedema of pregnancy, epilepsy and premenstrual tension. DIAMOX has also been used in emphysema, drug-induced oedema, renal oedema and obesity.

DIAMOX*

* REGD. TRADE MARK — ACETAZOLAMIDE

TABLETS (250 mg.): bottles of 25, 100 and 1,000
PARENTERAL: vials of 500 mg.

Lederle

LEDERLE LABORATORIES DIVISION
Cyanamid OF GREAT BRITAIN LTD., London, W.C.2

Nasal Congestion?

Neither ephedrine nor adrenaline give such sustained relief as Neophryn . . . yet Neophryn is safer than either. Neophryn produces effective decongestion without unpleasant side effects such as C.N.S. stimulation, sedation, or secondary congestion. It is safe for infants and children as well as adults, and is widely prescribed for the common cold, sinusitis and allergic rhinitis. Neophryn is also available with antihistamine.

Medical literature is available on request

Neophryn gives relief

Trade Mark

without secondary congestion

Neophryn is a sympathomimetic amine (1-m-hydroxy-α-methylaminomethyl benzyl alcohol HCl) in aqueous solution; available as a spray or drops

Basic N.H.S. cost of Nasal Spray or Drops **2/4**. With antihistamine (in spray form only): **2/8**

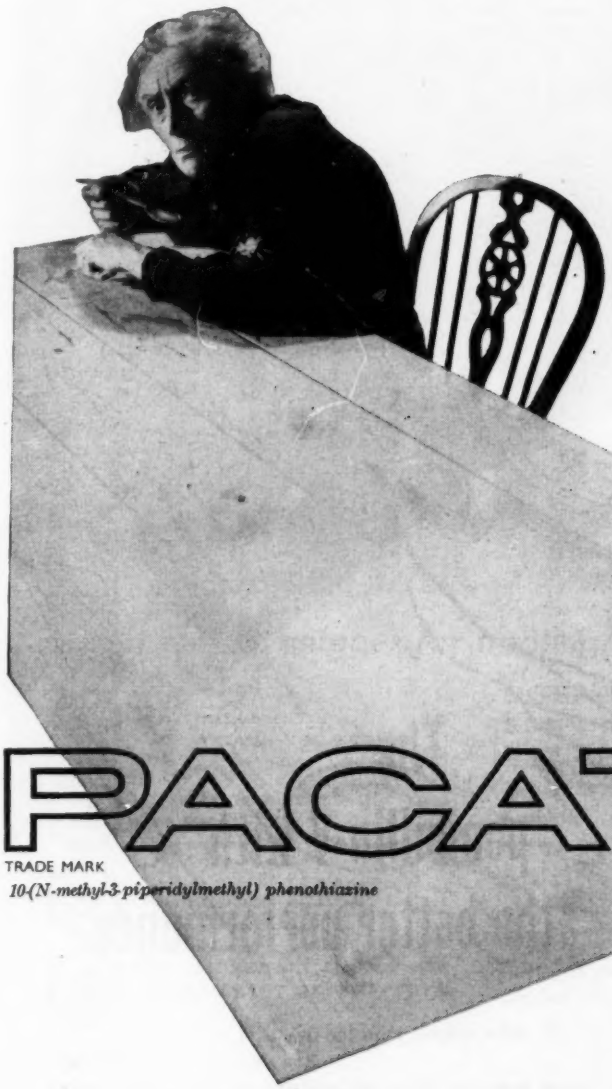
Bayer Products Limited

Neville House, Kingston-on-Thames, Surrey.

Associated exporting company: Winthrop Products Limited

BAYER

GERIATRICS



The senile patient

Pacatal is particularly valuable for senile patients developing states of excitement or depression. Pacatal promotes a return to normal behaviour patterns so that the patient is easier to live with and, indeed, continues as a useful member of the family circle.

PACATAL

TRADE MARK

10-(N-methyl-3-piperidylmethyl) phenothiazine

Dosage:
1 tablet (25 mg.) two or three times a day.

Presentation:
Tablets of 250 and 10 mg. strength in bottles of 50 and 500.
Ampoules each containing 50 mg. in 2 ml. in boxes of 10 and 50.

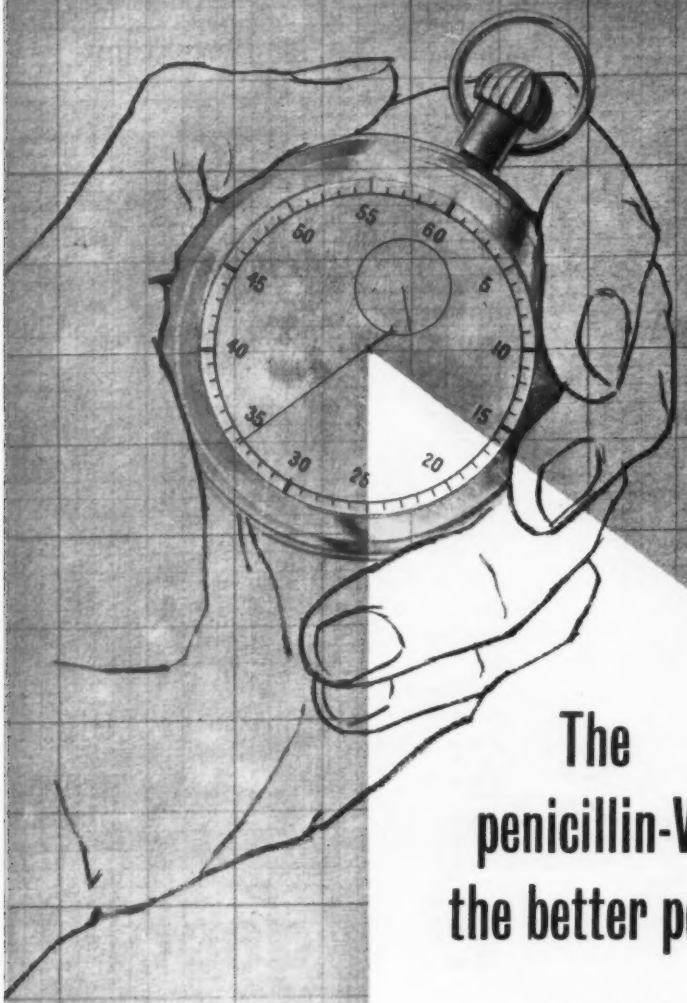
WARNER

PAC 368/4

WILLIAM R. WARNER & CO. LTD., LONDON and EASTLEIGH.

Calcipen-V

CALCIUM PENICILLIN V



The penicillin-V with the better performance

* more soluble than the free acid
* produces higher blood levels
* quicker onset of action

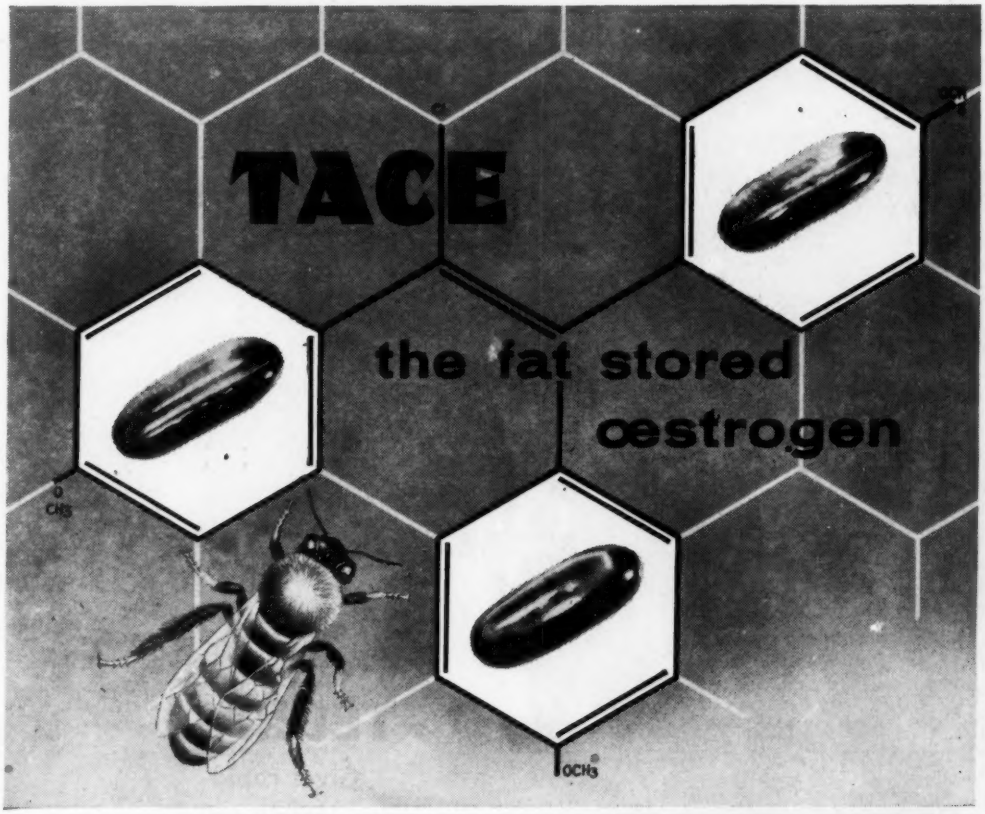
Available in tablets of 60 mg. and 120 mg.

Literature and further information gladly sent on request

BOOTS PURE DRUG CO. LTD., NOTTINGHAM, ENGLAND

Boots

S.307



Has these advantages for treating the menopause

1. **VIRTUALLY NO WITHDRAWAL BLEEDING**
2. **GRATIFYING FEELING OF WELL-BEING**
3. **PROLONGED ACTION**
4. **NO NAUSEA OR ANY OTHER UNPLEASANT SIDE EFFECTS**

DOSAGE

SIMPLY TWO CAPSULES PER DAY FOR 30 DAYS

A month's course of 60 capsules can provide prolonged or even permanent relief for many menopausal patients. A second course may be required, but a third is not often necessary. After oral administration 'TACE' is stored in the body fat and released gradually in a manner resembling natural hormone secretion.

PACKS

Green 'TACE' capsules contain 12 mg. chlorotrianisene, and are packed in bottles of 60 and 300.

INHIBITION OF LACTATION

4 capsules a day for 7 days

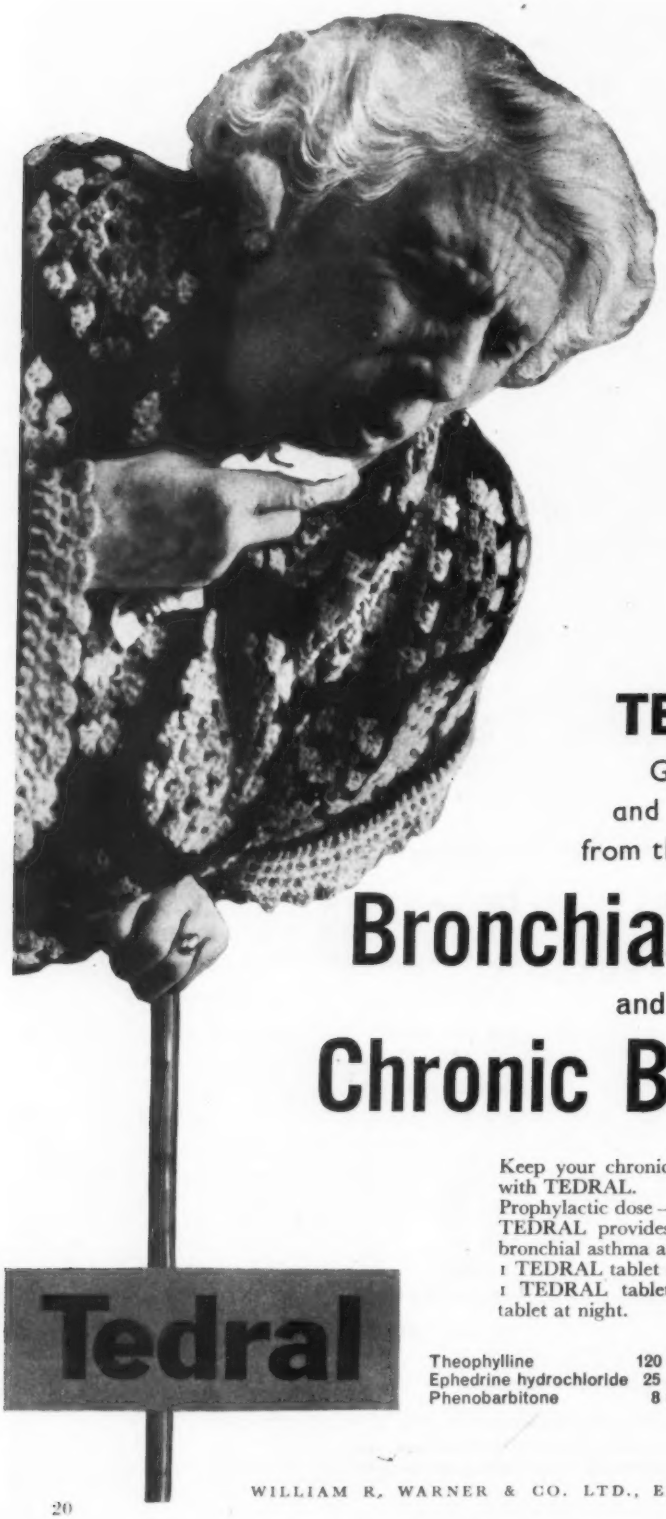
Write for details of the new film dealing with 'TACE' for the inhibition of lactation.

Merrell Research

'TACE' is a registered trade mark of the Wm. S. Merrell Co.

Distributed in Britain and Irish Republic by

RIKER LABORATORIES LIMITED, LOUGHBOROUGH, LEICS.



TEDRAL
TRADE MARK

Gives rapid
and lasting relief
from the symptoms of

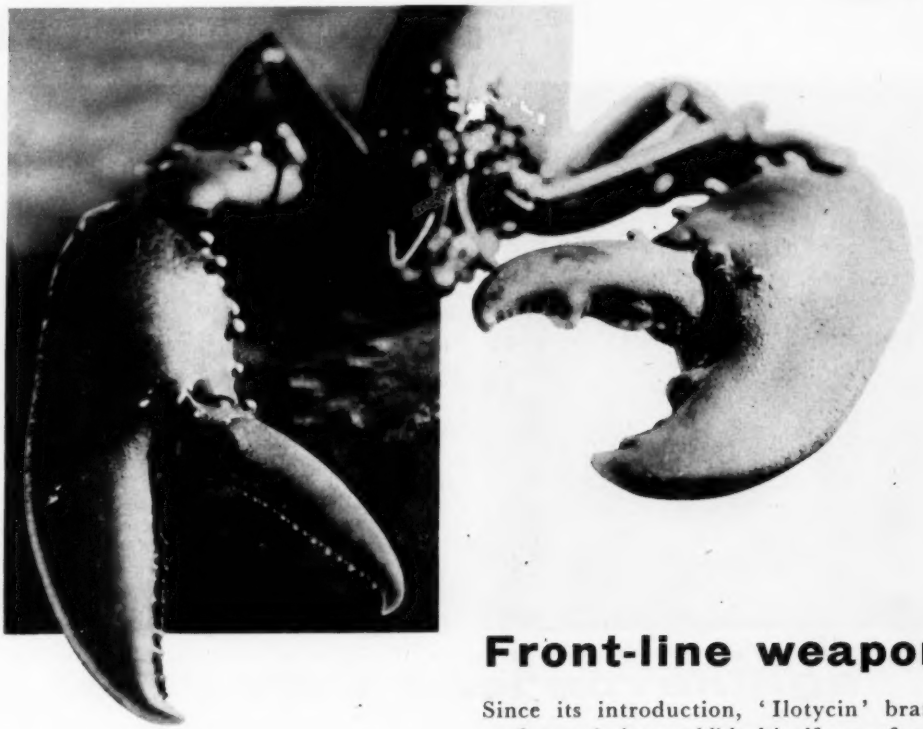
Bronchial Asthma
and
Chronic Bronchitis

Keep your chronic bronchitic patients up and about with TEDRAL.
Prophylactic dose — 1 tablet 4 times a day
TEDRAL provides 24 hour protection to your aged bronchial asthma and chronic bronchitis patients.
1 TEDRAL tablet every 4 hours during the day.
1 TEDRAL tablet and 1 TEDRAL enteric coated tablet at night.

Theophylline	120 mg. (2 gr.)
Ephedrine hydrochloride	25 mg. ($\frac{3}{8}$ gr.)
Phenobarbitone	8 mg. ($\frac{1}{8}$ gr.)

WILLIAM R. WARNER & CO. LTD., EASTLEIGH, HAMPSHIRE.

TED 384/4



Front-line weapon

Since its introduction, 'Ilotycin' brand erythromycin has established itself as a safe and potent oral antibiotic. Clinical experience has shown that it can play a vital part as a front-line weapon against a wide range of infections. 'Ilotycin' has a penicillin-like antibacterial spectrum, is powerfully bactericidal, has negligible effect on the normal intestinal flora, and is fully effective by mouth. It has accordingly become the logical first choice after penicillin in the treatment of common infections.

The average daily dose is 1 Gm. increased in severe infections.

'Ilotycin' is available as Tablets of 100 mg. and 250 mg.; also as 'Ilotycin' Paediatric and as 'Ilotycin Glucoheptonate' Intravenous.

'ILOTYCIN'

THE ORIGINAL ERYTHROMYCIN

DISCOVERED BY *Lilly*

ELI LILLY & COMPANY LIMITED · BASINGSTOKE · ENGLAND

PRO-BANTHINE* IN ULCER HEALING

FIG. 1. "*But X-ray study at this time still revealed the ulcer niche.*"

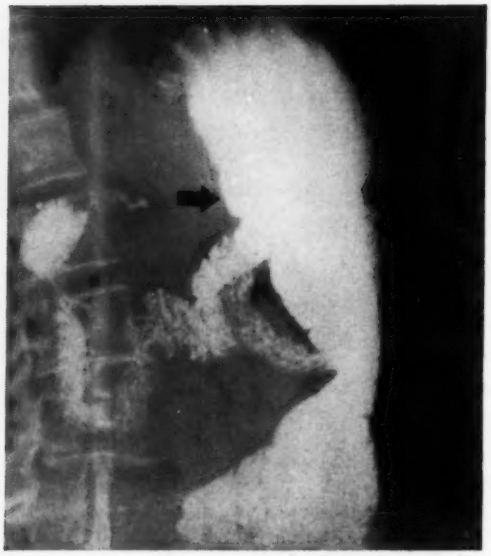


FIG. 2. *In ten weeks "the niche was no longer visible radiologically or gastroscopically."*

Clinical Report on Pro-Banthine

The case-history below of ulcer on the gastric side of gastro-jejunal stoma reveals significantly the high potency in low dosage of the well-tolerated anti-cholinergic agent, Pro-Banthine.

M. D., female, age 48, had a posterior gastro-jejunostomy fourteen years previously for duodenal ulcer. Nine months prior to her first visit severe intractable pain recurred and a subtotal gastrectomy was performed at another hospital. She remained well for a few months and then because of recurrence of severe pain and marked weight loss, she was referred for treatment. X-ray study revealed a large ulcer niche on the gastric side of the anastomosis. Antacids and sedatives gave no relief from pain. She was given 45 mg. of Pro-Banthine four times a day and within seventy-two hours was able to sleep through the night for the first time in weeks. After two weeks of Pro-Banthine treatment the patient felt completely well, but X-ray study at this time still revealed the ulcer niche (Fig. 1). After a further ten weeks' treatment the niche was no longer visible radiologically or gastroscopically (Fig. 2). In the five months prior to the report she was maintained on 30 mg. of Pro-Banthine four times daily without any recurrence of symptoms.

Pro-Banthine is the safe, potent anti-cholinergic agent which effectively controls excessive parasympathetic activity in the gastro-intestinal and genito-urinary tracts.

Pro-Banthine tablets containing 15 mg. of propantheline bromide are available in bottles of 40, 100 and 1000 tablets.

Parenteral Pro-Banthine is available in vials containing 30 mg. of propantheline bromide as a dry sterile powder, in boxes of 6 and 25 vials, for injection where needed.

Pro-Banthine with phenobarbitone tablets (15 mg. of each) are available in bottles of 40, 100 and 1000 tablets. G. D. Searle and Co. Ltd., High Wycombe, Bucks. Telephone : High Wycombe 1770.

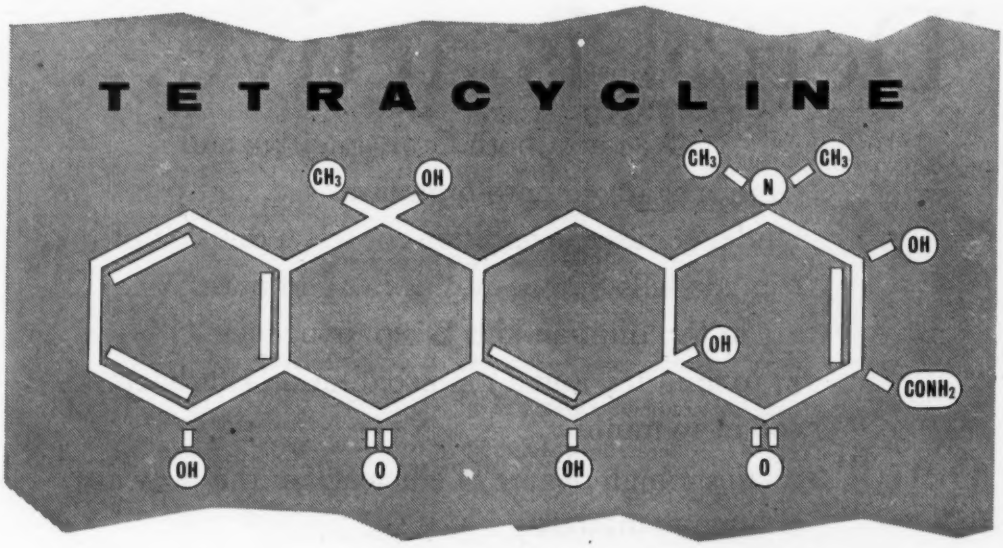
* *Registered Trade Mark*

SEARLE

PB : P57

22

Turning



to the very best advantage

Medical history has already reserved a special place for ACHROMYCIN tetracycline because of its impressive therapeutic potency and remarkably broad spectrum. Now, with the advent of ACHROMYCIN V, the therapeutic merits of tetracycline are turned to still greater advantage. Presenting tetracycline in company with sodium metaphosphate, ACHROMYCIN V achieves swifter, more efficient, more complete absorption. As a result, the therapy becomes still more secure, without any increase in daily dosage or cost. Customary adult dosage is a single capsule (250 mg.) four times daily—though this may safely be increased in unusually severe conditions.

ACHROMYCIN*

TETRACYCLINE WITH SODIUM METAPHOSPHATE · *REGD. TRADE MARK

Each oral capsule contains ACHROMYCIN tetracycline 250 mg; Sodium Metaphosphate, 380 mg. Bottles of 16, 100 and 1,000. ACHROMYCIN V is also available as an orange-flavoured syrup containing in each 5 c.c. 125 mg. of tetracycline activity. Bottles of 2 and 16 fl. oz.

Lederle

LEDERLE LABORATORIES DIVISION
Cyanamid OF GREAT BRITAIN LTD., London, W.C.2

'Dettol' is active...

REGD.

against both Gram-positive and Gram-negative micro-organisms.
Under standard conditions of test a dilution of 1 in 200 kills Staph. aureus in 10 minutes; a 1 in 500 dilution kills Strep. pyogenes in 10 minutes, and a 1 in 250 dilution kills Bact. coli in 10 minutes.

'Dettol'—retains a high degree of efficiency in the presence of organic matter.

'Dettol'—is not incompatible with soap, traces of which need not be removed before application.

'Dettol'—is non-poisonous and non-staining.

'Dettol'—is well tolerated by the skin and tissues.

INSTRUMENT 'DETTOL'
Instrument Dettol is widely used as a most effective and practical means of disinfecting surgical instruments – steel, stainless steel and plated, as well as glassware, rubber appliances and nylon sutures.

SURGICAL 'DETTOL'
Surgical Dettol is a specially formulated tincture for the surgical preparation of the skin. It remains actively bactericidal for a considerable period after drying. It dries quickly and leaves a non-slippery surface. Bactericidal action is not adversely affected by the use of ordinary soap solutions. Surgical Dettol in clinical use has proved non-toxic and non-irritant when used in accordance with the directions.

For leaflets giving full information on Instrument Dettol and Surgical Dettol *Please write to:*
RECKITT & COLMAN LTD.,
PHARMACEUTICAL DEPARTMENT, HULL.

In the treatment of migraine . . .

* **Femergin**

TABLETS
1 mg. Ergotamine Tartrate B.P.

AMPOULES
0.5 mg. Ergotamine Tartrate B.P./ml.

"If ergotamine tartrate
by itself is not effective,
it may be more effective when combined
with caffeine, such as Cafergot tablets
(ergotamine tartrate 1 mg., caffeine 100 mg.)
or rectal suppositories . . .

Cafergot

TABLETS
1 mg. Ergotamine Tartrate B.P.
100 mg. Caffeine B.P.

SUPPOSITORIES
2 mg. Ergotamine Tartrate B.P.
100 mg. Caffeine B.P.
0.25 mg. total alkaloids of belladonna
100 mg. *iso*butylallyl barbituric acid

If Cafergot tablets
and rectal suppositories are used
the initial dose should not exceed
2 tablets or 1 suppository,
and the total daily dose should not exceed
6 tablets or 2 suppositories.

Dihydroergotamine

SOLUTION
2 mg. dihydroergotamine methanesulphonate/ml.

AMPOULES
1 mg. dihydroergotamine methanesulphonate/ml.

Some patients develop nausea
and vomiting with ergotamine tartrate,
and the newer preparation
dihydroergotamine methanesulphonate (D.H.E.45)
is less liable to produce gastric upsets
but is not so generally effective . . ."

British Encyclopaedia of Medical Practice,
Interim Supplement No. 181 — October 1957, page 12

ALL BY **SANDOZ**

* The original Ergotamine Tartrate B.P.
(marketed outside the British Isles as Gynergen)

Sandoz Products Limited

Sandoz House
23 Great Castle Street
London, W.1

A PLEASING *impression is not the only reason why foliage plants have gained such popularity in the modern home. They have the added advantage of easy maintenance, long-lasting effects, and an ability to withstand a variety of often unfavourable conditions.*

Comparably, when it comes to oral penicillin therapy, although the pleasing impression imparted to your patient by an attractively flavoured preparation is important in ensuring that your treatment is favoured, it is by no means the main feature influencing your choice. Oral Penidural has the added advantage of long-lasting effects following each dose, and benzathine penicillin's stability in gastric juice means that it can be given irrespective of the times of meals. Simple teaspoonful dosage at six-hourly intervals enables adequate blood levels to be attained and maintained with ease and the minimum of disturbance to your patient. Extensive reports of the routine use of Oral Penidural in domiciliary and hospital practice underline its reliability and time-saving convenience in the treatment of penicillin-sensitive infections.

Long lasting effects with

Wyeth JOHN WYETH AND BROTHER LIMITED, CLIFTON HOUSE, EUSTON ROAD, LONDON, N.W.1

Pd.5

Monstera deliciosa

oral PENIDURAL*

BENZATHINE PENICILLIN

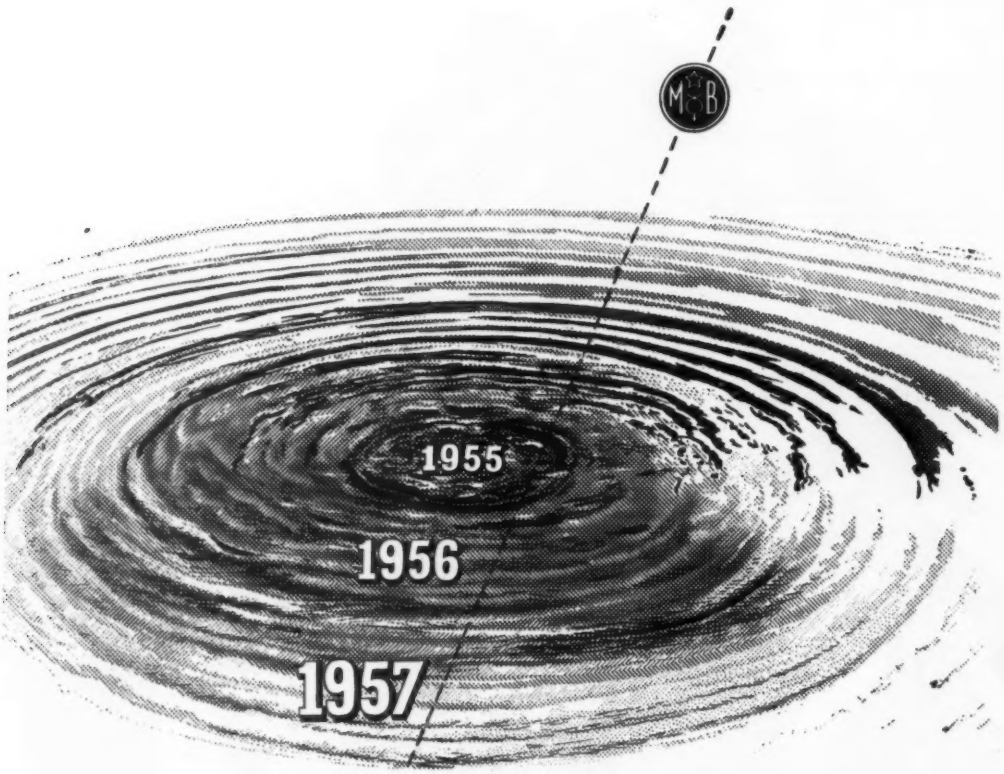
PACKS:

Suspension in 60ml. bottles (each 5ml. teaspoonful contains 300,000 units).

Tablets in tubes of 20 and bottles of 100. Each tablet contains 200,000 units.

Oral Drops in 10ml. bottles (complete with dropper calibrated to deliver 100,000 units).

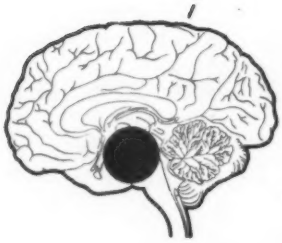
*trade mark



DURING THE THREE YEARS
SINCE 'LARGACTIL' WAS INTRODUCED,
THE INDICATIONS ORIGINALLY RECOGNIZED
HAVE BEEN GREATLY EXPANDED AND
THE DRUG IS ACCEPTED TODAY
AS A VALUABLE THERAPEUTIC AGENT
IN ALMOST EVERY BRANCH OF MEDICINE.

Increased production has enabled
progressive price reductions to be made.

Detailed information is available on request.



'Largactil'
trade mark *brand*

CHLORPROMAZINE HYDROCHLORIDE

MANUFACTURED BY
MAY & BAKER LTD

An **M&B** *brand Medical Product*
MA4682

DISTRIBUTORS: PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD · DAGENHAM · ENGLAND

The new complete treatment for migraine

ORGRAINE

Composition (per tablet)			Action
Ergotamine Tartrate B.P.	1.0 mg.	→	constricts dilated cerebral arteries.
Caffeine B.P.	100.0 mg.	→	potentiates ergotamine.
Hyoscyamine Sulphate B.P.C. (1949)	0.0875 mg.	→	alleviates nausea and vomiting.
Atropine Sulphate B.P.	0.0125 mg.		
Phenacetin B.P.	130.0 mg.	→	relieves residual occipital pain.

In a recent clinical article (J.A.M.A., 1957, 163, 1115) it was stated that in a series of 2,511 cases in which 28 agents were tested in the symptomatic treatment of migraine, ergotamine tartrate was proved to be the most useful drug—and 81% of the patients showed improvement when ergotamine tartrate and caffeine were compounded with belladonna alkaloids. Orgraine applies the same successful principles of treatment.

PACKS: Tablets individually foil-stripped, in boxes of 10 and 100.

ORGANON LABORATORIES LIMITED

BRETTENHAM HOUSE · LANCASTER PLACE · LONDON W.C.2

Telephone : TEMple Bar 6785/6/7, 0251/2/3, 1942/3. Telegrams : Menformon, Rand, London

...have I been disappointed in this expectation... The more I saw of the great powers of this plant, the more it seemed necessary to bring the doses of it to the greatest possible accuracy. I [illegible] this degree of accuracy was not

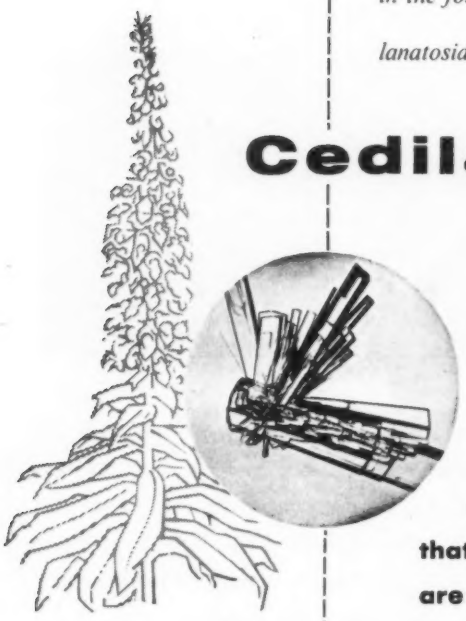
— William Withering, M.D., 1785

"The great powers of this plant"

are brought to the physician of today

in the form of the pure crystalline cardiac glycoside

lanatoside C—



Cedilanid

BY **SANDOZ**

combining all the classical actions of Digitalis leaf with "the greatest possible accuracy of dosage," rapid onset of therapeutic action, and rapid elimination to ensure that the effects of overdosage are short-lived.

TABLETS	0.25 mg. lanatoside C
SOLUTION	1 ml. (approx. 30 drops) contains 1 mg. lanatoside C
AMPOULES	2 ml. contain 0.4 mg. desacetyl-lanatoside C

Sandoz Products Limited

Sandoz House

23 Great Castle Street

London W.1

NEW

ENAVID*

BRAND OF NORETHYNODREL AND ETHYNYLOESTRADIOL 3-METHYL ETHER

For the specific control of menstrual irregularities

ENAVID, containing the new Searle steroid norethynodrel, permits *specific* and usually complete *control* of the menstrual cycle on *oral* administration and thus provides effective therapy for most menstrual irregularities.

ENAVID has strong progestational and a lesser oestrogenic activity on the endometrium, which stimulates its development to a secretory phase. It also inhibits the secretion of gonadotropins by the anterior pituitary gland.

ENAVID is therefore recommended for:

- **AMENORRHOEA** (Primary and Secondary)
- **OLIGOMENORRHOEA**
- **MENORRHAGIA**
- **METRORRHAGIA**
- **DYSMENORRHOEA**
- **PREMENSTRUAL TENSION** and the
- **"INADEQUATE LUTEAL PHASE"**

ENAVID is supplied as 10 mg. tablets in bottles of 20 and 50 tablets.

Detailed literature is available on request.

* *Trade Mark.*

SEARLE

G. D. SEARLE & CO., LTD., HIGH WYCOMBE, BUCKS. Tel. High Wycombe 1770

EN : P117

31

now available

the Safer

broad spectrum antibiotic

MYSTECLIN V

Squibb tetracycline hydrochloride and nystatin with added sodium metaphosphate.

faster, higher initial
tetracycline blood levels

plus...unique protection
against monilial overgrowth

SQUIBB

NYSTATIN, the specific and safe antifungal antibiotic, provides added protection. Among the patients most likely to be susceptible to overgrowth of Candida albicans are: those requiring high or prolonged antibiotic dosage; debilitated or elderly patients; diabetics; infants, particularly prematures; and women, particularly during pregnancy.
Each Mysteclin-V capsule contains 250 mg. tetracycline hydrochloride plus sodium metaphosphate and 250,000 units of Nystatin.
Supplied in bottles of 12 and 100 capsules.

Further information may be obtained from:

E. R. Squibb & Sons Ltd, 17–18 Old Bond Street, London W.1

Serpasil

(the alkaloid reserpine from Rauwolfia)

ANTIHYPERTENSIVE

GRADUAL AND SUSTAINED REDUCTION

OF BLOOD PRESSURE

SYNERGISTIC EFFECT WITH OTHER

ANTIHYPERTENSIVES •

MODERATE SLOWING OF HEART-RATE

CALMING EFFECT

Tablets of 0.1 mg. and 0.25 mg. in bottles of 25, 100 and 500. Elixir containing 0.25 mg./5 c.cm. in bottles of 100 c.cm. 1 mg. and 4 mg. tablets, 1 mg. and 2.5 mg. ampoules also available.

C I B A

'Serpasil' is a registered trade mark. Reg. user

CIBA LABORATORIES LIMITED, HORSHAM, SUSSEX

Telephone: Horsham 4321. Telegrams: Cibalabs, Horsham.

8/6

relief of cough

BENYLIN EXPECTORANT* is a rational and effective preparation containing Benadryl* and expectorants for the relief of cough associated with irritative and congestive conditions of the respiratory tract. It inhibits the cough reflex, alleviates congestive symptoms, such as nasal stuffiness, and exerts a soothing effect on the upper respiratory mucosa. Benylin Expectorant is presented as a pleasant raspberry-flavoured syrup, and as it is free from opiates is suitable for children as well as adults.

**Trade Mark*

Benylin Expectorant

demulcent · decongestant

Supplied in bottles of 4, 16 and 80 fl. ozs.

Parke, Davis & Company, Ltd. *(Inc. U.S.A.)* Hounslow, Middx. Tel: Hounslow 2361

234

The order of the day...

'LANOXIN' *for maintenance therapy*

It never varies in potency.

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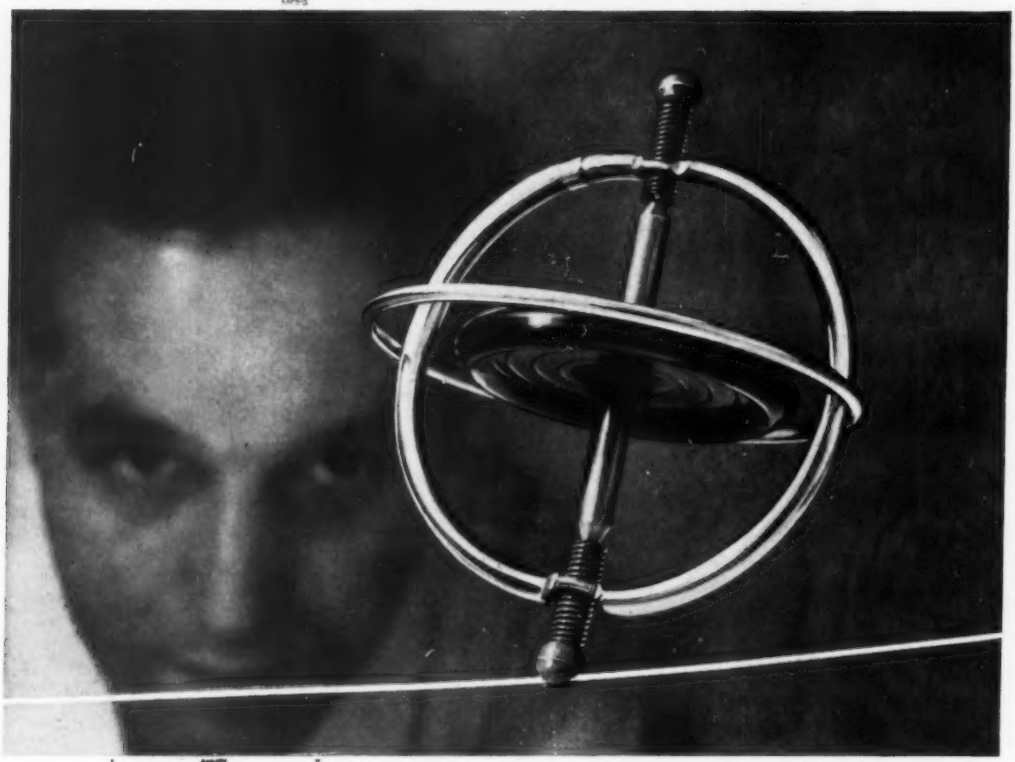

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AMAUROSIS FUGAX *

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THE term " amaurosis fugax " embraces those conditions which evoke in the sufferer the conviction of blindness (monocular or binocular, photopic or scotopic) and in which recovery is complete enough to leave no *subjective* residue. If, after repeated attacks, subjective residual effects assert themselves or blindness supervenes, the primary cause, whatever its exciting mechanism, has evidently damaged the visual system beyond its capacity to survive.

These conditions are hard to classify : take, for example, angiospasm, a condition that seems to provide the commonest direct cause for amaurosis fugax; is the central nervous system, or the cardiovascular system responsible ? The nervous system appears, for example, to awake the symptom-complex of migraine, but it cannot assume first place in angiosclerosis, where the basis for the reaction lies in the roughening of vessel walls and narrowing of the lumina, with the role of the central nervous system purely reflex.

Central Nervous System

Inflammatory

Woywitka and Riches (1950) described amaurosis fugax in two sisters aged 3 and 9 years, in whom whooping-cough led to acute encephalitis with cerebral œdema. The pupils did not react and were dilated. There were no other local abnormalities. Recovery of sight was complete but slow.

Keith Lyle (private communication) describes the illness of a girl, aged 7 years, admitted to the National Hospital for Nervous Diseases, London.

During an attack of chickenpox, she awoke one morning and remarked that it was " quite dark." There was no perception of light in either eye, and the pupils were fixed and semidilated. There was gross œdema of the disc, and surrounding exudates. Vision in both eyes returned to 20/30 within 4 weeks. The condition was ascribed to acute anterior retrobulbar neuritis.

* From a lecture given on Jan. 2, 1957, to the Puget Sound Academy of Ophthalmology and Otolaryngology, Seattle, Washington.

Reflex

Transient blindness as a result of reflex action seems relatively common, but the activating causes differ widely.

Morelli (1952) mentioned transitory ipsilateral blindness following a mandibular injection of procaine and adrenaline for dental extraction. He traced 25 such cases in the literature, and advocated care in avoiding the lingual nerve. Inhalations of amyl nitrite may help to restore vision. Ferrante (1950) described transient blindness following the insertion of a needle for a pneumothorax refill ; and Mercier (1947) recorded a similar incident during lavage of the pleural cavity with Dakin's solution in the treatment of purulent pleurisy. Cerebral œdema was thought to be the probable cause in the first instance, and spasm of retinal and cerebral vessels in the second.

Hines et al. (1936) describe " suppressor strips " in the cortex of monkeys, each with its own projection-system by way of the basal ganglia, one such being in close proximity to the striate visual cortex. Strychninisation of those strips leads to cessation of electrical activity of the cortex. Frank Juler (private communication) believes that complete obstruction from spasm alone is rare, and holds that thrombosis or embolism are important in the induction of amaurosis fugax. Doggart (private communication) thinks that too little attention has been directed to transient lowering of the blood-pressure as a result of some emotional upset or anxiety state. Moreover, the psychosomatic approach cannot be excluded in some cases.

Traumatic

There is argument as to whether blows on the skull without perforation can cause amaurosis fugax. Möller (1942) reported blindness resulting from contrecoup injuries, affecting the cerebral ventricles and brain-stem. He described vasoconstriction followed by dilatation, rather as in migraine.

A soldier blinded after a shell burst had pale discs and contracted retinal vessels. He made a complete recovery, and the condition was attributed to vasospasm.

Patients with subarachnoid hæmorrhage have also experienced transient blindness.

During the first world war, I fell on the ship's deck during a game and received a sharp blow over the visual area ; I was rendered blind for a few seconds, yet remained fully conscious.

In 1944 a man had a bullet-graze transversely across the tip of the occiput and he was " blind for 10 days." In 1956 he had strange visual sensations—of looking into a very bright light, followed by darkness. Vision, corrected with minus

CAUSES OF AMAUROSIS FUGAX

Central Nervous System						*New Growth*
Inflammatory	Reflex	Traumatic	Nutritional	Degenerative	Visuo-psychic	
Whooping-cough Chickenpox	Irrigation of pleural cavity, antrum or vagina. Pleural puncture. Mandibular block. Suppressor strips.	Closed head-injuries. Sub-arachnoid hæmorrhage.	Beri-beri. Malnutrition-alœdema.	Schilders's disease. Disseminated sclerosis. Devic's disease.	Hysteria. Migraine. Pregnancy.	Cerebral tumour. Sarcoma of choroid.

Cardiovascular System							
Inflammatory	Reflex	Traumatic	Patho-physiological	Degenerative	Metabolic	Anatomical	Biochemical
Endocarditis. Polyarteritis. Inflammation within vessel sheaths. Carotid occlusion.	Angiospasm.	Hæmorrhage into optic nerve.	Blackout. Bends. Digital pressure. Valvulotomy. Carotid sinus. Vasovagal. Alkalosis. Heart-block. Hæmorrhage. Glaucoma. Quinine. Carbon monoxide.	Angiosclerosis.	Diabetes mellitus.	Vasodilatation of orbital veins. Takayaso's disease.	? Migraine.

spheres, was 20/20 (partly): the optic fundi were normal, except for a very small scotoma that could be plotted at the margin of central fixation, recording a right homonomous hemianopia. He had no headaches or other distressing phenomena. The attacks were separated by long remissions and he could work.

Nutrition

When 2500 airmen were freed from Japanese prisoner-of-war camps, 200 had visual symptoms. 20 were so affected as to need reablement at St. Dunstan's. Some had had short periods of transient blindness (Livingston 1946).

One officer remarked that he had just settled down in the library to read when he suddenly had a "complete blackout," from which, in an hour or so, he recovered enough to read the large print in books. Examination of rod function showed that there was less disturbance with scotopic than with photopic vision. Ophthalmoscopically, the appearances were of the late effects of an œdematous tide that, laden with toxic elements, had carried its flow along Henle's layer to the macular area: there were atrophy of the temporal quadrant of the optic disc and degenerative changes involving macula and fovea, with, here and there, new-vessel formation chiefly from below—similar to that seen in diabetic retinopathy, though much less luxuriant.

Degenerative

In the demyelinating diseases, symptoms depend on the area of the central nervous system attacked (Behrman 1951). They can provoke amaurosis fugax in one of two ways—through the medium of cone or of rod vision.

The case of a nursing sister provides an example of rod-cell involvement. She had had a slight attack of retrobulbar neuritis which depressed the central vision to 20–80 in her left eye for 2 weeks in 1928. No cause was found. In 1931, when I was beginning a long study of night vision, she offered the information that she was subject to periods of night-blindness, and to prove it I set her to walk along a pathway in the hospital garden on a clear starlit night. Had I not seized her she would have fallen into a ditch, though to a normally dark-adapted person it was clearly visible. Through ignorance I failed to link the first episode with the second. In 1934 the full impact of her illness (multiple sclerosis) in cerebral form became clear and went on rapidly to its pathetic end.

Visuo-psychic

Some 300 sq. cm. of brain surface is said to be allotted to visual perception, and this area is closely associated with areas 18 and 19, which are related to psycho-visual reaction. Psychic depression of vision amounting to blindness is well recognised.

A patient was invalided from India to England with a diagnosis of "sunglare retinitis"—a condition that I am sure does not exist primarily. His pupils had been dilated with atropine, literally soaked in the drug. He had been led and guided for two months. I stopped the atropine. When pupil reactions were normal and the eye-grounds showed no abnormality, I took him to Sir John Parsons, who diagnosed hysterical amblyopia. He was cured by hypnotic treatment. The exciting cause was found to be the infatuation of a handsome sergeant with the patient's wife, and the aggravating cause the patient's ugliness. One morning he had studied his features while shaving and had, then and there, "gone blind."

I have seen four cases of amaurosis fugax since July, 1955, where hysteria seemed to play an important part.

A man, aged 36, "blacked out" on stooping; his visual acuity was 20/15. His visual fields showed a partial ring scotoma in each eye, and the right calf muscles were wasted—presumably a legacy of childhood poliomyelitis. When very tired he had diplopia. The optic fundi appeared normal.

A woman, aged 41, "blacked out for about a minute," and was much distressed. Occasionally, in bed with the light out, she had a feeling as if butter muslin had been drawn in front of her left eye. On rare occasions she saw red on shifting her eye to one side. Visual acuity 20/20 in each eye, tension normal, fields clear, optic fundi normal.

A woman, aged 22, had intense headaches lasting "as long as a week". She had gone blind in the left eye for periods of 1 to 4 minutes as a child of 13. She believed now that her central field of vision went first and that peripheral vision tended to remain. Visual acuity in both eyes was 20/20, and all visual systems were normal.

A girl, aged 8, had been previously normal except for pseudomyopia. Her mother's left eye had been removed in childhood. One day, at school, she suddenly exclaimed that she could not see with her left eye. This condition remained unchanged for 2 hours. Next day there were some signs of recovery, and when I examined her 4 days later visual acuity was 6/6 in both eyes, but the left optic disc was not clear and there was a concentric contraction of the visual field. A week later, both fields were contracted to about 10°, acuity remaining normal and optic fundi clear. In view of this, I suggested a neurologist's opinion, offering the tentative diagnosis of hysteria or peripheral interstitial neuritis. The opinion of the neurologist was that the condition was functional; but all such obscure cases load us with worries, because all cannot be functional all the time.

Evidently there is a suggestive link between functional and migrainous conditions. Having an intimate personal knowledge of migraine, its periodicity, the causes that provoke an attack, and the pattern experienced, I see every reason to place migraine under the heading visuo-psychic. The viciousness of my own hemicrania is now happily relegated to the background. It could be traced to periods of overwork, anxiety, or unabating stress, and to an allergic reaction to chocolate. Moreover, where highly sensitised pathways exist a devastating attack of migraine can be excited by the presentation of a visual dilemma.

Driving down an avenue of tall elm-trees, where sunlight penetrates and casts scintillating shadows, can provoke an attack. This led me to search for a method of producing synthetic migraine and nausea. In the second world war, we were selecting men for the glider division and it was very important to eliminate those prone to motion sickness. A film-strip was made which cast a dazzling stream of wavy lines on a curved screen. The subject under test stood in its concavity, so that the irritating stimuli impinged over a large retinal area, while he looked through a clear space and read from a chart or placed and replaced a ring over a vertical wire supported on a stand. With a "sensitised" subject an attack of migraine could be induced, and 20% of a small group of subjects experienced feelings of mild nausea. The test was not used in practice because other devices could filter more men at a time, and time was precious.

Livingston and Bolton (1943) compared night visual capacity in psychiatric patients and normal subjects. In this test we used the rotating hexagon, an apparatus standardised for the examination of air-crew. We found evident reduction in the night visual capacity of those with anxiety states or depression. The connection between this work and amaurosis fugax may appear far-fetched, but it is mentioned to emphasise how strong is the influence of the visual mind. The case of the woman who had amaurosis in two consecutive pregnancies with no apparent organic cause (Muth 1953), was perhaps of the same order. F. A. Juler (private communication) described amaurosis fugax in pregnancy, vision returning after the uterus had been emptied.

New Growth

Malignant disease of the globe or of structures beyond the orbit can cause amaurosis fugax (Behrman 1951).

A woman, aged 37, said that at intervals, on looking toward the door during her clerical duties in the local post-office, she experienced periods of "temporary blindness." At other times, people entering "seemed to be without heads." She had a rapidly growing pituitary tumour. There was 6D of swelling of the discs, and characteristic field changes.

A less common case was that of a sergeant-pilot who had successfully completed one bomber operational tour, and, after a period of rest, had been posted to an operational training unit to prepare for his second tour. He had previously had a high standard in both photopic and scotopic vision,

but now he complained of severe night-blindness interspersed with periods when vision at low illumination seemed to improve. Examination of his night visual capacity with the hexagon test and of his scotopic field with the night-vision screen test showed that he was now unfit for night flying. He was found to have a rapidly growing sarcoma of the choroid with a small pedicle and a large head. The eye was removed. He was well 3 years later, after which trace of him was lost.

Cardiovascular System

Wagener (1952) believes that the term "amaurosis fugax" should be used only when the sensation of blindness is limited to 10 minutes. Are we then to accept that a transient loss of sight of 11 minutes is something different, though the cause is basically the same? Wagener mentions Rothenstein's account of a patient whose blindness was said to have lasted 45 minutes, with full recovery.

It seems that by far the commonest single cause of temporary blindness is *angiospasm*, which, according to Wagener, quoting Pal, "results from the excitation of vasoconstrictor nerves from the direct stimulus of vasoconstrictor fibres and the irritation of the intima by small emboli." Sir George Pickering is quoted by James Doggart (private communication) as saying that spasm is seldom the explanation. Doggart feels that transient lowering of the blood-pressure is a dominant cause.

Juler also thinks that simple spasm must be rare, and quotes the case of a seaman with valvular disease of the heart who was alarmed at a sudden flash from a crossed electric cable in semidarkness. 2 hours later the right eye failed and became quite blind, but recovered almost completely during a further 2 hours. After a night's sleep he awoke to find the eye had become permanently sightless. This sequence was explained on the ground that the shock from the flash caused an embolus to be detached, which lodged in the retinal artery and then passed on, to be followed by thrombosis during sleep.

Davenport (1931) described an interesting case of *spasm of the central artery* recurring time and again over a period of 20 years, with the retention of excellent visual acuity. He witnessed some of the attacks, which lasted for from a few seconds to 3 minutes. The pupil of the affected eye was dilated and fixed and the disc pale. Blood-pressure was 180/95 mm. Hg. There was no suggestion of Raynaud's disease.

Carotid occlusion is discussed by Wagener as a cause of transient blindness.

Uræmia is given by Keith Lyle (private communication) as a cause of amaurosis fugax after prostatectomy in a man of 65. He recovered his vision completely in a few days.

Eclampsia may also cause transient blindness.

Reflex

It seems that angiospasm of the retinal vessels, merely as an unprovoked reflex, is not by itself fully acceptable as the cause. Some authorities claim to have seen contractions of the vessel walls and waves of spasm during a severe attack of migraine. I confess that I have never seen a contracting vessel in these cases. The only retinal vessels I have seen in contraction, when at some time migraine has provided a dominant symptom, have been those reflexly irritated by embolic threat or thrombosis.

Patho-physiological

It is within this group that my experience has been widest. Amaurosis fugax can be induced at will during the manœuvres of aviation. The visual experience of blackout in aviation is especially interesting because, by changing alternately air-speed, rate of turn, and the time that the effects of gravity are allowed to work, it is possible to pass through all stages of visual failure from a sensation of greyness to complete blindness and, in the end, loss of consciousness (Livingston 1939). The chief factor responsible is, of course, the exsanguination of the brain by centrifugal force. But blackout is not due entirely to failure of the retinal circulation; simultaneously, a severe handicap is placed on the basal ganglia and visual cortex. The visual pathway has a survival mechanism of the highest order. During a low-pressure chamber experiment, as the atmosphere is exhausted shadows creep in from the periphery, but acuity of foveal vision persists, even under protracted anoxia corresponding to an altitude of 23,000 feet, or until collapse makes revival with oxygen imperative. Behrman (1951), quoting Dartnell and Thompson, of the Vision Research Unit of the Institute of Ophthalmology, London, suggested that there was an auxiliary oxygen-supply to the foveal area, perhaps within the yellow pigment itself. This may be the case, but there are other possibilities, suggested by the specialised structure of Henle's fibre layer so intimately associated with this area.

I was engaged in a "bends" test, the object of which was to observe the conjunctival capillaries with a slit-lamp at high altitude with full oxygen-supply, to ascertain whether or not nitrogen could be seen breaking out in bubble form. At 38,500 feet, while intent on a noticeable change in the direction of the blood-flow, accompanied later by stasis, I leaned too hard against the table supporting the slit lamp and compressed my oxygen-tube. The result was a rapid onset of facial and neck spasms with warning of loss of vision and consciousness. But while the mental confusion and discomfort quickly advanced, central vision was retained. A rapid descent to 20,000 feet restored normality. If the field of vision is plotted in "bends" during the time when pain is felt in knees and elbows, various peripheral and intermediate scotomas can be plotted, but I do not recall the appearance of a scotoma near the macula.

Transient blindness can be induced by digital pressure on the eyeball, especially in a subject with deep physiological cups. Cessation of blood-flow can be confirmed with the ophthalmoscope. Again, the loss of perception creeps in from the periphery and central vision is tenaciously maintained. More detailed work indicates that the last perceptual point lies, not in the fovea, but in an area between the fixation-point and the disc. Howarth (1956) exerted pressure on the globe until the last point of visual function had been reached, recorded, and then passed. The terminal field of vision seemed to occupy a small crescent-shaped area where the retinal blood-supply is probably richest, suggesting that the avascular fovea cannot exercise its function against so great a handicap to its special form of nutrition.

The clinical variations within this group range from over-stimulation of the carotid sinus (Behrman 1951) to quinine idiosyncrasy (not overdose) (Hertsberg 1946).

Allison (1956) cites a case of amaurosis fugax in a woman on the 2nd day after valvulotomy for mitral stenosis. She recovered in a week, but some field changes persisted. Allison says that "where cortical blindness is transient and recoverable, a stage may be reached when an object is identified without difficulty against a plain background but not against an assortment of other objects." He observes also that hæmorrhage from a duodenal ulcer may cause amaurosis fugax, an added complication being the adverse effect of massive doses of alkalis, which induce hypoxia because high blood-pH levels interfere with the dissociation of oxyhæmoglobin.

Fleeting blindness, in contrast with fainting, can be seen in vasovagal cases where the systolic pressure is low and the diastolic at fainting-point.

A man, aged 32, had visual blackouts of short duration, when friends, or articles of furniture, had to be grabbed for support. The patient had never engaged in active sport. The eyes were normal and the blood-pressure 110/65 mm. Hg.

Glaucoma is mentioned here because, during the progress of the disease, transient blindness may be experienced.

Recently, while scrubbing a floor, a patient suddenly lost the sight in her only eye. The visual field was found to be contracted to within 3° of the fixation point. Vision returned.

Poisoning with carbon monoxide may also produce amaurosis fugax (Duke-Elder 1954).

Degenerative

Time and again it has been shown that angiosclerosis plays a significant part in amaurosis fugax. Wolff (1951) describes the changes in the central retinal vessels, which he likens to pre-capillaries, and emphasises the localised proliferation of the subendothelial tissue together with new formation of elastic and connective-tissue fibres, the new-formed tissue bulging towards the lumen of the vessel.

Metabolic

So remarkable and diverse are the changes in diabetes that occasional cases of transient loss of vision are to be expected. But what is perhaps not quite so well recognised is the effect of anoxia on the condition (Livingston 1944) If a patient with long-standing diabetes, whether or not under full control, is exposed in a low-pressure chamber to an " altitude of 16,000 feet," and a record is made of the scotopic visual field—using a self-luminous target of radium paint, the luminosity of which is 10×10^{-9}—he becomes transiently blind much sooner than a normal subject, and islets of depression in retinal sensitivity can be plotted on the Bjerrum screen. Ophthalmoscopic appearances may be normal. The explanation seems to be that small portions of the retina are receiving oxygen under handicap at ground level because of fatty changes in the walls of the smallest vessels.

Anatomical

Amaurosis fugax has been recorded by Dodo (1951) in Takayaso's disease, in which arteriovenous anastomoses in the retinal vessels, with similar congenital abnormalities elsewhere, have resulted in a state of abnormally low blood-pressure.

Hogel (1952) records a case of amaurosis fugax in a woman with intermittent exophthalmos caused by varicose dilatation of the orbital veins.

Biochemical

It may be that some of the unlabelled cases are due to an untoward biochemical event. This seems a plausible approach in such cases as migraine in mild attack, ascribable to allergic causes. The recent work of Pirie and Van Heyningen (1956) is of interest.

* * *

My first object was to emphasise the important part that the ophthalmologist plays in the diagnosis of diseases of which the eye provides clues of the utmost value. My second object was to reaffirm the interrelationship between applied physiology and pathology. My third was to bring these matters together in an examination of that fascinating and frequently elusive condition, amaurosis fugax.

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TREATMENT OF SEVERE HÆMORRHAGE

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DESPITE much progress in recent years, the treatment of severe hæmorrhage is still far from satisfactory. Even in departments well trained and equipped for transfusion, a relatively high proportion of patients are lost for various reasons, even though all known techniques are fully used. For instance, the death-rate from severe hæmorrhage from a gastric or duodenal ulcer is still about 12% (Holubec 1952a, Kane et al. 1955, Rozanov 1950), and postpartum hæmorrhage is often the chief cause of maternal death.

The results of our work on the causes of failure in the treatment of hæmorrhage (Firt and Hejhal 1952, 1953, 1954, 1956, Hejhal and Firt 1952, 1953, 1954) have now been put to extensive clinical and experimental trials in Czechoslovakia and elsewhere (Case et al. 1953, Cookson et al. 1954, Cookson and Costas-Durieux 1954, Hampson et al. 1954, Nakasone 1954, Peleška 1954, Richards and Hansen 1954, Theilen et al. 1954, Gurd and Gardner 1955, Holden and Portman 1955, Strawitz et al. 1955, Minář et al. 1950). We therefore summarise here the main results of our work in more than 500 dogs, and in clinical trials, over a period of three years, which seem to be of some importance to the treatment of severe hæmorrhage.

There are three types of failure:

(1) The largest group is that in which the rate and amount of blood transfused was insufficient.

(2) In a smaller group the amount and rate seems sufficient, but the patient deteriorates with continuing transfusion. Most of these failures are ascribed to the grave initial state of the patient—particularly severe shock and irreversible changes.

(3) The smallest group includes those patients in which the rate and amount of transfused blood, otherwise corresponding to the patient's needs, induces cardiac failure.

The recognition of the third group led to great caution in giving rapid transfusions (and thus to a danger of giving too little) and also to the use of intra-arterial transfusion.

In attempting to define more rigidly the criteria and optimum amount and rate of intravenous transfusion, we have, among other things, used measurements of venous pressure. Even in the second group, clinical deterioration with continuing transfusion is accompanied by a large rise in venous pressure (i.e., cardiac overload-

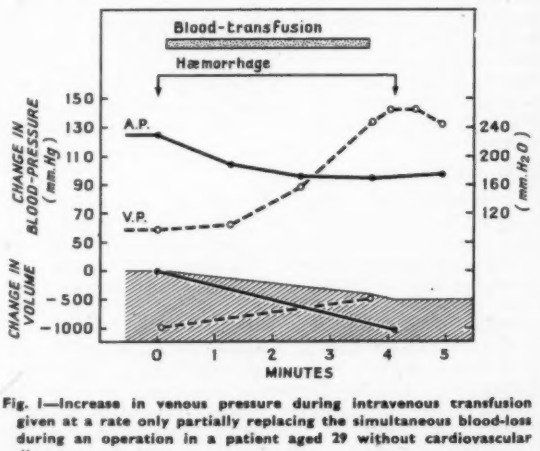

Fig. 1—Increase in venous pressure during intravenous transfusion given at a rate only partially replacing the simultaneous blood-loss during an operation in a patient aged 29 without cardiovascular disease.

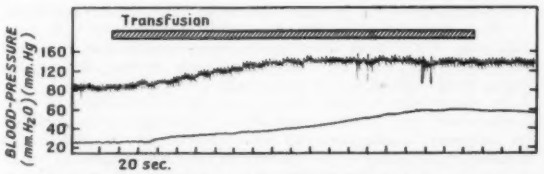

Fig. 2—Pressure changes during intravenous transfusions (at a rate of 6 ml. per kg. per min.) of heparinised blood into a dog after hæmorrhage.

ing), in patients with no primary lesion of the cardiovascular system. This sometimes happened even though only about half of the estimated blood-loss had been replaced, and in no case had blood-loss been fully replaced (fig. 1).

In these patients the theoretical requirements of the patient do not accord with the ability of the cardiovascular system to accept intravenous transfusion without overloading. This question has been the subject of our researches and we shall here present a review of the general findings.

Experiments

Experiment 1

8 dogs, of average weight 21·1 kg., under light thiopentone anæsthesia, were bled from the femoral artery at a rate of

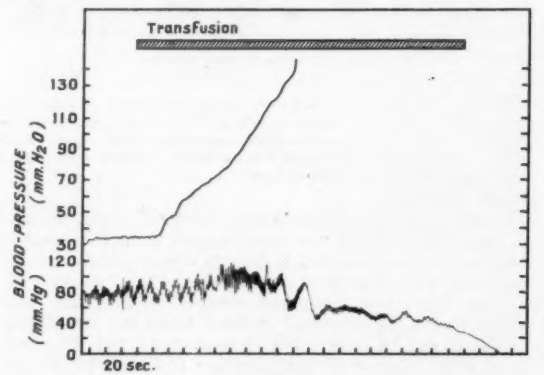

Fig. 3—Pressure changes during transfusion of citrated blood (other conditions as in fig. 2).

2 ml. per kg. per min., until an arterial pressure was reached of 60 mm. Hg. Heparin (50 mg. per 500 ml.) was added to the removed blood. After 30 min. the blood was transfused into the femoral vein at a rate of 6 ml. per kg. per min. Arterial pressure was measured directly during the experiment from the femoral artery, and venous pressure directly from the inferior vena cava through a catheter inserted from the femoral vein.

There were no signs of cardiac overloading during transfusion. Venous and arterial pressures returned to pre-hæmorrhage values, and all the animals survived rapid transfusion and recovered (fig. 2).

Experiment 2

The same experiment was performed in 8 dogs of average weight 20·3 kg., except that instead of heparin, 2 ml. of 3·8% sodium citrate solution was added per 10 ml. of blood. The total amount of added citrate solution was subtracted from the transfusion, so that the total transfused volume corresponded to the amount of blood lost.

A typical picture of cardiac overloading and failure was seen during transfusion in all the animals. The venous pressure started to rise from the beginning of the transfusion, and later the arterial pressure fell. All the animals died either during or just after completion of the transfusion (fig. 3).

Experiment 3

6 dogs, of average weight 12·6 kg., under a light thiopentone anæsthesia, were similarly prepared. Heparin was added to the withdrawn blood as above. After 30 min., a transfusion of this blood was started in one jugular vein (the fastest rates of transfusion were given into both jugular veins simultaneously). In individual experiments the rate of transfusion was raised (from 20 to 77 ml. per kg. per min.). Arterial and venous pressures were measured as above. Cardiac failure did not develop in any animal. Blood-pressure rapidly rose; if venous pressure rose above initial values it rapidly returned to normal after completion of the transfusion. All the animals recovered (fig. 4).

Experiment 4

Pressure was measured directly in the pulmonary and femoral arteries, pulmonary vein, and inferior vena cava in

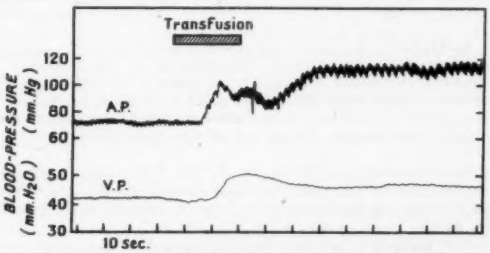

Fig. 4—Pressure changes during transfusion of heparinised blood at a rate of 77 ml. per kg. per min.

12 dogs (average weight 23·4 kg.). 3·8% citrate (0·5–1·0 ml. per kg. body-weight) was injected into the jugular vein. Both arterial pressures fell, then rose; both venous pressures rose then fell (fig. 5).

Experiment 5

19 dogs were given intravenous injections of sodium citrate solution, calcium gluconate solution, and procaine solution. Arterial and right ventricular pressures were measured (the latter by catheter) during all the experiments.

(*a*) 6 dogs received 3·8% citrate (1·5 ml. per kg.) into the femoral vein. After ten minutes, the dose was repeated, with simultaneous administration of 10% calcium gluconate (0·7 ml. per kg.) into the jugular vein. The administration of calcium gluconate reduced the effect of citrate by 50–60%.

(*b*) 8 dogs were given citrate initially as above. After ten minutes they were given 1% procaine 0·5 ml. per kg. into the same vein, and a minute later received a further infusion of citrate and 10% calcium gluconate 0·5 ml. per kg. into the jugular vein. After a further ten minutes, citrate and calcium

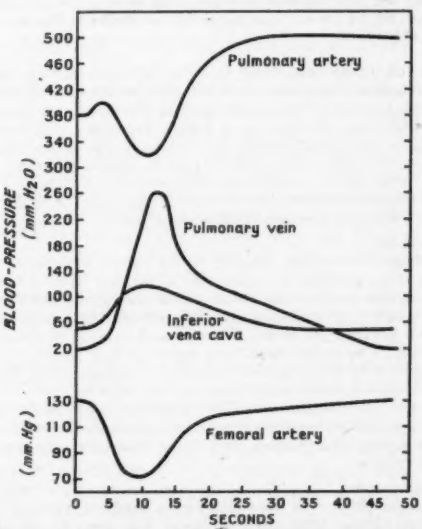

Fig. 5—Pressure changes in individual parts of the circulatory bed in a dog following intravenous administration of citrate.

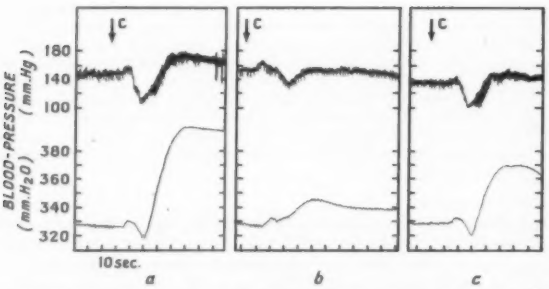

Fig. 6—The effect of calcium and procaine on pulmonary vasoconstriction and myocardial depression produced by the injection of 1·5 ml. per kg. of 3·8% citrate in a dog : (a) the effect of citrate alone; (b) the effect of citrate with 10% calcium gluconate 0·5 ml. per kg. and 1% procaine 0·5 ml. per kg.; (c) the effect of citrate, with calcium alone (in the same dosage). Citrate and calcium injected at C.

gluconate were again given, as before but without procaine. The combination of calcium and procaine counteracted the effect of citrate more than the same dosage of calcium alone (fig. 6).

(c) A further 5 animals were subjected to the same procedures as in (b), but the dose of calcium gluconate was raised to 0·6 ml. per kg. The combination of calcium gluconate (0·6 ml. per kg.) and procaine (0·5 ml. per kg.) completely counteracted the effect of citrate in 4 out of 5 animals (fig. 7).

Experiment 6

Hæmorrhage was produced at a rate of 2 ml. per kg. per min. in 8 dogs under light thiopentone anæsthesia until arterial pressure fell to 60 mm. Hg. 3·8% sodium citrate solution was added to the removed blood in a ratio of 2 : 10. Transfusion

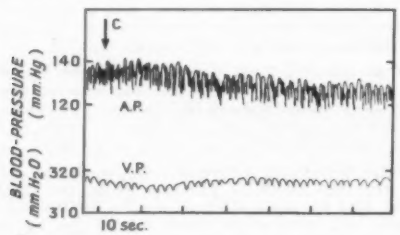

Fig. 7—Counteraction of the effect of 3·8% sodium citrate (1·5 ml. per kg.) by the simultaneous administration of 10% calcium gluconate (0·6 ml. per kg.) and 1% procaine (0·5 ml. per kg.). Citrate and calcium given at C.

was begun thirty min. later at a rate of 6 ml. per kg. per min. Before transfusion, the animals had received 1% procaine (0·15 ml. per kg.) intravenously, and procaine was then given as a slow drip infusion of a 0·25% solution. 10% calcium gluconate was given during the course of the transfusion in a quantity enough to prevent the rise in venous pressure.

All these animals survived, and pressure-curves at the end of the transfusion were no different from those in experiments 1 and 7 where heparinised blood was used.

Experiment 7

12 dogs, of average weight 15 kg., were bled at a rate of 2 ml. per kg. per min. to a pressure of 60 mm. Hg. After thirty minutes, the entire volume of blood was transfused into the femoral artery (6 dogs) or femoral vein (6 dogs), both at a rate of 6 ml. per kg. per min. Arterial and venous pressures were recorded. The experiment was repeated in a fortnight on the same group of animals, the transfusion groups being reversed. The blood was heparinised (50 mg. per 500 ml.).

All the animals survived the experiment. There was no significant difference between venous pressure curves from the two routes of transfusion, and in no case did this rise above initial values.

Experiment 8

Experiment 7 was repeated in 14 dogs of average weight 21·5 kg., except that citrated blood was used (2 ml. of 3·8% sodium citrate per 10 ml. of blood.) 7 dogs received intra-arterial transfusion, and 7 intravenous transfusion. There was a significant rise in venous pressure in all the experiments.

The venous pressure rose less after intra-arterial (average 130 mm. H_2O) than after intravenous transfusion (average 255 mm. H_2O) (fig. 8). All the animals in the intravenous group died. All in the intra-arterial group survived.

In these experiments, the citrate concentration was estimated in 8 dogs in blood withdrawn from the right ventricle by catheter (4 animals with intra-arterial and 4 with intravenous transfusion). The concentration in intra-arterial transfusion was much lower than during intravenous transfusion throughout the entire experiment (fig. 9).

Experiment 9

5 dogs were prepared as in experiment 7, except that heparinised blood was transfused intra-arterially, while 2 ml. of 3·8% sodium citrate was infused separately intravenously for every 10 ml. of heparinised blood given intra-arterially. The venous pressure rose as much as with intravenous transfusion of citrated blood, and all the animals died.

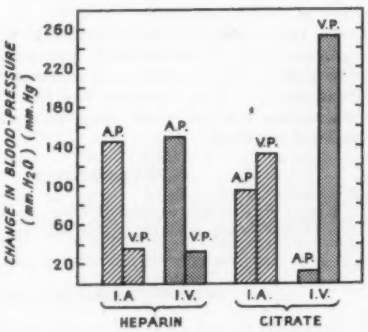

Fig. 8—Rise in venous and arterial pressure with various methods of transfusion in dogs with a standardised hæmorrhage (see text). Each column represents the average values of an entire group.

Discussion

The results from the first group of experiments show that the cause of cardiac overloading and failure during rapid intravenous transfusion is not, as has been assumed, solely the amount and rapidity of blood inflow. The second group of experiments (in which citrated instead of heparinised blood was used) suggest that the cause of cardiac overloading and failure is citrate, added in the ordinary way to prevent coagulation.

This conclusion disagreed sharply with widely held views about the safety of citrated blood for transfusion (Kilduffe and DeBakey 1942, Adams et al. 1944, Thornton et al. 1945, Allen et al. 1949, De Gowin et al. 1949, Keynes 1949, Strumia and Graw 1949, Whitby and Britton 1950, Bagdasarov and Gulyayev 1951, Blinov 1952, Nyegovski 1952, Nyegovski et al. 1952), though some reports (Bruneau and Graham 1943, Ivy et al. 1943) have indicated that rapid and large transfusions may lead to citrate intoxication. The use of citrated blood, however, has not been held responsible for cardiac overloading, and this, we believe, has led to an incorrect explanation of the dangers of transfusion in clinical practice, and an incorrect evaluation of the innocuousness of citrate infusion. Our experiments indicate that citrate causes circulatory disturbances which end in cardiac failure.

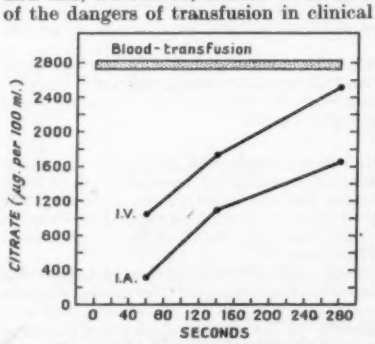

Fig. 9—Concentration of citrate in blood taken from the right ventricle during intra-arterial and intravenous transfusions of citrated blood under identical conditions (each curve gives the average values of 4 experiments).

In experiment 4 there were pressure-changes after injection of citrate (fig. 5), and for analysis it is convenient

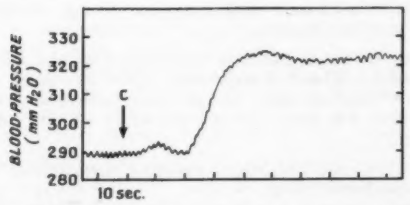

Fig. 10—Pressure changes in the pulmonary artery after intravenous administration of citrate. In this case, pressure did not decrease even when cardiac activity was weak.

to divide the graph into two sections, before and after the lowest value of arterial pressure.

In the first section there is a fall in systemic arterial and pulmonary arterial pressures, with a rise in pressure in the systemic and pulmonary veins. These changes are manifestations of myocardial insufficiency, and can also be produced by direct introduction of citrate into the coronary arteries.

In the second section there is a return of myocardial compensation, systemic arterial pressure returns to normal, and, with a clearing of the blood-volume from the venous system and the pulmonary vein, pressures here fall. Pulmonary-artery pressure, however, does not return to normal, but is still higher than previous values, suggesting that citrate has produced a constriction in the pulmonary vascular bed with increased flow-resistance, and that this effect lasts longer than the direct myocardial one.

With intravenous administration, citrate of course is distributed to the pulmonary bed before it enters the coronary arteries. The vasoconstrictive effects can be seen in short peaked wave in the beginning of the pulmonary-artery pressure record. Increased pulmonary vascular resistance does not necessarily, of course, produce a rise in pulmonary-artery pressure during myocardial insufficiency, but it is so intense in some cases that pulmonary-artery pressure does not fall even in these periods (fig. 10). The vasoconstriction produces obvious blanching of the lung parenchyma after intravenous administration of citrate.

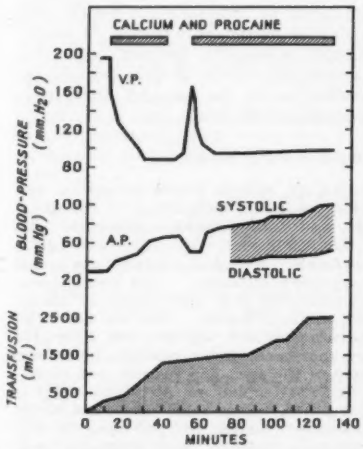

Fig. 11—Traumatic shock, complicated by severe hæmorrhage, treated by transfusion of citrated blood and plasma, and administration of calcium and procaine (case 1).

It seems, too, that there is no great difference between so-called toxic and non-toxic doses of citrate. During rapid transfusion, citrate (or rather, a decrease in ionised calcium) produces pulmonary vasoconstriction which loads the right ventricle. Later, there is a direct toxic effect on the myocardium. These effects will depend on the initial state and load of the myocardium, and the heart may become overloaded and fail at any time.

Further experiments and clinical experience have shown that in such clinical states as severe anæmia and heart-disease, and during cardiac and thoracic surgery, relatively small doses of citrate may be very dangerous. There is a particularly unfavourable response in post-hæmorrhagic hypotension and in shock. Thus, for example, the average lethal dose of citrate is, in normal animals, 14·5 ml. of 3·8% solution per kg., infused at 1 ml. per kg. per min. In animals with posthæmorrhagic hypotension of about 50 mm. Hg lasting for one hour, the lethal dose is only 2·1 ml. per kg. infused at the same rate.

In these states we have also observed a slower rate of removal and excretion of citrate from the organism. In older samples of conserved blood, there is further danger from the higher serum concentration of potassium, which will have a hæmodynamic effect similar to that of citrate. Even small and relatively slow transfusions of citrated blood or plasma may then be dangerous (Hejhal and Firt 1954b, patient no. 1).

If citrate is the main toxic element in the transfusion of ordinary stored blood, it follows that non-citrated blood can be safely transfused much faster. Experiment 3 confirms this, and, together with other experimental work, shows that rapid intravenous transfusion can cope with practically any degree of hæmorrhage. We have, for example, in another group of experiments, transfused 23 litres (i.e., 14 times the blood-volume of the animal), in ninety minutes into a dog bleeding from an artery without observing any abnormal changes in arterial or venous pressure (Firt and Hejhal 1954c, Hejhal and Firt 1953b).

It is not practicable to use heparinised blood in clinical practice, but the effect of citrate in ordinary conserved blood could be counteracted. Experiment 5 shows that the effect may be counteracted by calcium gluconate, and that the counteraction is further potentiated by intravenous procaine. The use of calcium for the treatment of citrate intoxication is, of course, well known; we have merely applied this to transfusion techniques. The results with procaine suggest that citrate may also act via nervous receptors in the vascular bed. In animal experiments then, it is possible to achieve the same effects with citrated blood, using calcium and procaine, as with heparinised blood (experiment 6). The measurement of venous pressure is not only a useful indication of the rate of transfusion, but also serves as a means of indicating the amount of calcium needed during transfusion. This same approach has been applied to clinical material (Firt and Hejhal 1954a and b, Hejhal and Firt 1953b, 1954b).

The primary advantage of intra-arterial transfusion is supposed to be less cardiac loading, permitting rapid transfusion for the treatment of severe hæmorrhage. It is claimed that intra-arterial transfusion produces a greater and more rapid rise in blood-pressure after hæmorrhage than intravenous transfusion, and makes possible the renewal of activity after cardiac standstill (Kohlstaedt and Page 1943, Glaser and Page 1946, Kay and Hacker 1947, Porter et al. 1948, Robertson et al. 1948, Asatiani 1951, Bagdasarov and Gulyayev 1951, Wilson et al. 1951, Berman and Akman 1952, Holubec 1952b, Keet et al. 1952, Nyegovski 1952, Nyegovski et al. 1952, and others).

Experiment 7 showed that, when heparinised blood is used, cardiac loading is the same with both intra-arterial and intravenous transfusion. There was no demonstrable difference in the rise in venous pressure between intra-arterial and intravenous transfusions of heparinised blood, even where the rate of transfusion and the degree of hæmorrhage were varied (Firt and Hejhal 1953a, Hejhal and Firt 1954b and d).

Experiment 8 explains the lack of agreement between our own experiences and other published work, since

intra-arterial transfusion of *citrated* blood produces less cardiac loading than intravenous transfusion of the same amount of citrated blood. Even so, intra-arterial transfusion of citrated blood is more toxic than intravenous transfusion of heparinised blood. These results show that the transfusion route is far less important than whether or not citrate is given.

In experiment 9, when intra-arterial transfusion was combined with intravenous administration of citrate alone, the result confirmed this. The main difference between intra-arterial and intravenous administration of citrated blood seems to be the fact that citrate is cleared from the capillary bed with intra-arterial administration; thus a smaller concentration of citrate reaches the pulmonary and coronary circulations than with the intravenous route. These concentration differences have been demonstrated in samples of right ventricular blood (experiment 8).

The same argument applies to the therapeutic effect of transfusion after hæmorrhage—raising arterial blood-pressure. When heparinised blood is used, there is no therapeutic difference between the intra-arterial and the intravenous route. Citrate decreases this therapeutic effect, but to a greater degree with intravenous than with intra arterial transfusion (fig. 8). The above explanation would also apply here.

On the basis of these results, it seems that the real advantage of intra-arterial transfusion lies only in the greater clearing of citrate, with a subsequent diminution of the pharmacological effect of citrate in the thoracic circulation. It also seems, however, that a far more effective approach, both in terms of counteracting the citrate effect and in terms of clinical safety, would be to use calcium and procaine. Since intravenous transfusion is far more convenient and rapid to start in an emergency than an intra-arterial one, and in our experience a faster rate can be given intravenously than the highest reported intra-arterial rate, most of the indications for intra-arterial transfusion seem no longer valid.

One indication for intra-arterial transfusion would, however, remain—i.e., cardiac standstill with so-called clinical death. But here as well we consider it absolutely necessary to give calcium and procaine to counteract citrate action (Hejhal and Firt 1954b. Peleska 1954).

Clinical Results

The same approach has been applied in clinical practice, combining calcium and procaine with intravenous transfusion of citrated blood, and with the use of venous pressure measurements as a routine clinical tool (useful but not mandatory).

With a transfusion-rate of up to 6 ml. per kg. per min. (about 400 to 500 ml. per min.), 10 ml. of 10% calcium gluconate is given before transfusion, with a further 15 ml. intravenously after the first 100 ml. of blood has run in. This suffices for 500 ml. of blood. A further 10 ml. of 10% calcium gluconate accompanies every further 500 ml. of blood.

With plasma infusion (a higher concentration of citrate per litre of infused fluid) larger doses are used: 15 ml. of 10% calcium gluconate before infusion, and a further 25 ml. after the first 100 ml. of plasma has been run in. A further 15 ml. of calcium gluconate accompanies each subsequent 500 ml. of plasma. The calcium solution must never be given, of course, into the same infusion bottle, infusion tubing, or infusion vein as the transfusion or plasma infusion (there is a danger of coagulation). We give it into another vein, usually that of the other arm in which venous pressure is being measured. Procaine (0·6 ml. per kg. of 0·25% solution) is given as a rapid infusion at the same time as calcium gluconate, and before starting the transfusion. A continuous drip is then run in at a rate of 5 drops per 10 kg. per min. of 0·25% procaine solution.

A large group of patients treated in this way has been described by Minář et al. (1957). 62 of the most severe cases of hæmorrhagic shock were selected (average transfusion 4·6 litres, at a rate of 1–6·5 ml. per kg. per min.).

They were divided into 5 subgroups according to the site of the hæmorrhage.

(1) Patients with gastro-intestinal hæmorrhage (gastric and duodenal ulcer (19 cases), gastric carcinoma (3), œsophageal varices (2), rectal tumour (2), operation on the bile-duct (1)). There were no deaths from hæmorrhage. 1 patient with œsophageal varices died thirteen days after transfusion in hepatic failure, and 1 with a gastric ulcer died twenty-seven days after gastric resection with peritonitis, from rupture of the gastric suture line and bronchopneumonia.

(2) Accidents (to limbs (6), abdominal and retroperitoneal injury alone or in combination with cerebral injury (3), and lung injury alone or in combination with cerebral injury (3)). There were no deaths from hæmorrhage. 1 patient died from extensive cerebral injury and another from septicæmia and bronchopneumonia.

(3) Obstetric and gynæcological cases (abnormal placental insertion (6), other obstetric forms of hæmorrhage (4), hæmorrhage during a gynæcological operation (1)). There were no deaths in this series.

(4) Hæmorrhage during thoracic and cardiac operations (pneumonectomy (4), lobectomy (3), mitral valvulotomy (3), and tricuspid valvulotomy (1)). There were no deaths due to hæmorrhage in this series.

(5) A case of successfully treated hæmorrhage during splenectomy for thrombocytopenia.

Transfusion was fully successful in all 62 cases. The technique of rapid intravenous transfusion is simple, and no special or complicated apparatus is required. Measurement of venous pressure is helpful, but not necessary. There were no unfavourable effects of this transfusion method, and the technique is far simpler than that required for intra-arterial transfusion.

Illustrative Case-histories

Case 1.—A man, aged 42, was in severe traumatic and hæmorrhagic shock after traumatic amputation of the distal two-thirds of one arm, and many jagged lacerations. The blood-pressure (B.P.) was 50/0 mm. Hg, pulse-rate 130 a minute, and the pulse feeble. The skin was pale grey, and mucous membranes appeared bloodless. The patient was apathetic, occasionally vomiting and complaining of thirst. Extremities were cold, veins collapsed. By the time the patient was in the operating-theatre, the B.P. was 30/0. He was immediately given morphine, and a procaine block was performed on the stump of the arm, and plasma- and blood-transfusions were started. After 300 ml. of plasma, typical cardiac overloading developed, which immediately abated by intravenous administration of calcium and procaine (fig. 11). During further transfusion, calcium and procaine were omitted for technical reasons at one point. Venous pressure rapidly started to rise, and was reduced again by more calcium and procaine. Operative repair could proceed within three hours of the start of transfusion, when the B.P. was 95/45, pulse-rate 90, pulse full, breathing regular, and skin and mucous membranes beginning to become pink. Under cover of continuous transfusion, the stump was repaired, an exploratory laparotomy was done because of a suspected ruptured spleen, and all lacerations were sutured. The patient withstood the operation well, and the postoperative course was without complications.

This case illustrated several points. A typical picture of cardiac overloading developed after 300 ml. of plasma, even though this amount was not given unusually quickly (0·5 ml. per kg. per min.)—in accordance with the view that patients in shock are hypersensitive to citrate. The patient would probably have died with ineffective transfusion had not venous pressure been measured and calcium and procaine administered, and this death would

have been attributed to "irreversible shock" and ineffective transfusion.

Case 2.—While in hospital, a woman, aged 38, suddenly started to bleed severely from rupture of an aneurysm of the gastroduodenal artery. A rapid intravenous transfusion was started within a matter of minutes, and the patient was removed directly to the operating-theatre. Hæmorrhage increased during surgical isolation of the aneurysm, and the B.P., which until then had been maintained at 90/60, suddenly became unmeasurable. A palpable pulse disappeared even from the carotid artery. The transfusion-rate was accelerated to maximum as soon as further blood arrived, and the B.P. was rapidly forced up to 120/90 with a full pulse. The operation was completed uneventfully under continuous transfusion. In the critical phase, 6 litres of blood were transfused in twenty minutes (about 6 ml. per kg. per min.). It was impossible to measure venous pressure in this case, and the empirical doses, suggested above, of calcium gluconate and procaine were given. The neck veins showed no overfilling. There were no further complications.

Case 3.—A woman, aged 31, admitted for threatened abortion. After several days of moderate blood-loss, there was a rapid onset of severe hæmorrhage with abortion. Despite manual removal of the placenta, uterine tamponade, and repeated administration of ergotamine, hæmorrhage continued and the patient lost consciousness. Pulse-rate was 120, palpable only at the carotid artery, and B.P. 50/0 (at times unobtainable). The skin was grey, pale, and cold, and the mucous membranes bloodless. After a rapid transfusion of 3 litres of blood with standard doses of calcium gluconate and procaine and 1 litre of plasma-expander, the radial pulse was full and the B.P. 95/50.

Severe hæmorrhage continued, and the patient was subjected to a supravaginal hysterectomy. At operation a slack uterus was found, filled with blood. Within about thirty minutes after operation, there was a renewal of intense hæmorrhage, and the patient had to be operated on again, at which time the bleeding stump of the uterus was removed.

Hæmorrhage lasted over five hours, and during this period the patient received 16 litres of blood and 2 litres of plasma-expander (polyvidone) at a rate up to 6·5 ml. per kg. per min., with calcium gluconate and procaine. The B.P. at the end of the second operation was 100/60 and the pulse full, with quiet, regular breathing, neck veins not overfilled, and mucous membranes pink. The postoperative course was uncomplicated.

Summary

Overloading and failure of the heart during rapid intravenous transfusion is not a function of transfusion per se but of the amount of citrate simultaneously given.

Citrate, even in small doses, produces vasoconstriction in the pulmonary vascular bed, and in larger doses depresses myocardial activity, both effects leading to cardiac overloading and failure.

Under conditions of shock, cardiac disease, severe anæmia, liver damage, &c., small doses of intravenous citrate may be very dangerous—even those contained in a slow transfusion of small quantities of blood.

Blood without citrate can be safely transfused at rates many times greater than can citrated blood not only intravenously but also intra-arterially.

The advantage of intra-arterial transfusion in the treatment of shock and hæmorrhage lies only in the increased rate of citrate filtration into the interstitial fluid, compared with the rate in intravenous transfusion, thus lowering the citrate concentration reaching the myocardium and pulmonary vascular circuit.

The effect of citrate during transfusion can be safely counteracted by the simultaneous intravenous administration of calcium and procaine.

This method of rapid intravenous transfusion with simultaneous administration of calcium and procaine has been critically evaluated in a selected group of surgical, obstetric, and gynæcological patients, and the results have confirmed the experimental data.

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THE ŒSOPHAGOGASTRIC SPHINCTER IN HIATUS HERNIA

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GASTROŒSOPHAGEAL reflux is the cause of the most disabling symptoms of hiatus hernia, but it is by no means an invariable accompaniment of hernia, nor can the size of the hernia be closely correlated with it. A large hernial sac may be associated with little or no reflux, yet severe œsophagitis may occur when the sac is small and inconstant, and sometimes even when no hernia can be found.

The factors responsible for reflux have not been clearly defined. This is not surprising, because the mechanism responsible for the competence of the normal œsophagogastric junction is still in dispute. The application of manometric techniques, however, has provided a more dynamic picture of the sphincteric mechanisms at the œsophagogastric junction than was possible by radiography alone (Fyke et al. 1956, Atkinson et al. 1957). It has shown that interposed between the œsophagus and the stomach there is a short segment in which the intraluminal pressure is higher than the pressure in the fundus. This increase of pressure is brought about by the tonic contraction of a muscular sphincter, which in normal subjects relaxes as an integrated part of the swallowing reflex.

Using a similar technique to study patients with hiatus hernia, we have measured the pressure gradient between the subdiaphragmatic stomach, the hernial sac, and the œsophagus. Our object was to determine (1) whether the sphincter demonstrable by manometry at the œsophagogastric junction in normal subjects is intrinsic or represents external compression by the diaphragm, and (2) whether the occurrence of gastrocesophageal reflux is correlated with any particular pattern of pressure gradients between the stomach, the hernial sac, and the œsophagus.

Methods and Patients

Technique of Recording Pressures

The pressures within the lumen of the œsophagus and stomach were transmitted through air-filled polyethylene tubes connected to metal-capsule optical manometers recording on photographic paper (Rowlands et al. 1953). The recording tip of the tube consisted of an open-ended segment of radio-opaque rubber 4 cm. long and 2 mm. in internal diameter. Pressures were recorded simultaneously from three such tubes with their tips spaced at intervals of 4 or 5 cm. The initiation of a swallow was signalled by the change in pressure produced in two small tambours strapped over the thyroid cartilage.

All measurements were made with the patient fasting, and lying on the left side because it was found that the pressure in the lower part of the œsophagus or in the hernial sac was increased by the weight of the mediastinal viscera when the subject was lying on his back. The tubes were passed through the nose until all the recording tips were below the diaphragm, and were then withdrawn in 1 cm. steps until the distal tip was at least 3 cm. above the œsophagogastric junction. Pressures were recorded at each step for at least fifteen seconds while the patient was breathing quietly. The tubes were returned to the stomach and the procedure repeated at least twice, and finally repeated with the patient swallowing small mouthfuls of water or making "dry" swallows at each 1 cm. step. Most of the patients were given barium to swallow at the end of the recording to determine whether a hernia was demonstrable at the time of the test.

Patients and Controls

18 patients with a hiatus hernia were studied, of whom 10 had a fixed hernia. The size of the sac was assessed crudely by measuring with a planimeter the maximum and minimum areas of the shadow seen on X-ray films. These areas are given, together with biographical and other data, in the accompanying table. The patients were not seen consecutively but were selected, partly to provide examples of a large hiatal sac with the œsophagogastric junction clearly separate from the diaphragm. They were not selected according to the presence or absence of clinical evidence of gastrocesophageal reflux.

The assessment of gastrocesophageal reflux is difficult, and different workers use different criteria. In our experience reflux of barium with the patient supine, whether horizontal or in the Trendelenburg position, does not correlate well with symptoms of œsophagitis, with the appearance of acid fluid in the mouth, or with the findings at œsophagoscopy. Reflux of barium may occur readily on one occasion, yet on another no reflux can be induced; moreover we have induced some reflux in healthy young medical students by asking them to swallow during the routine radiological procedures used to examine for hiatus hernia and reflux (and see Storch 1951). For these reasons we have not used radiological findings in the assessment of spontaneous reflux of gastric juice.

To avoid confusion we have adopted strict criteria which may possibly exclude some patients with reflux but are unlikely to include any without. In this paper we define reflux as the presence of pain, discomfort, or a burning sensation which is felt high in the epigastrium or behind the sternum and is brought on or made worse by lying flat, bending, or stooping. The occurrence of acid, bitter, or sour-tasting fluid in the mouth, however, has been taken as evidence of reflux, whether or not there is a postural relationship.

The control subjects consisted of 7 medical students and staff without gastro-intestinal symptoms and 8 patients without symptoms of œsophageal reflux, without radiological evidence of hiatus hernia, and of comparable age and sex with the patients with hiatus hernia.

Results

NORMAL ŒSOPHAGOGASTRIC JUNCTION

An open-ended tube was withdrawn in steps of 1 cm. from the stomach to the œsophagus at least three times in each of 15 control subjects. The position of the recording tip in relation to the diaphragmatic hiatus was identified from the inspiratory swings, which were

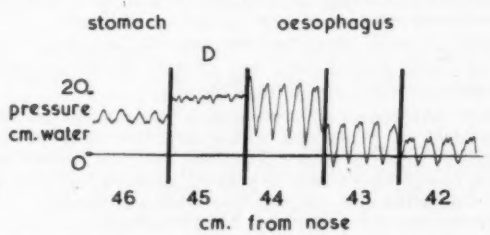


Fig. 1—Tracing of pressures at different levels as an open-ended tube is withdrawn in 1 cm. steps from the stomach into the œsophagus in a normal subject.

The segment of higher pressure at the level of the diaphragm (D) and in the lower end of the œsophagus represents a barrier to reflux. The direction of the respiratory-pressure swings indicates the position of the recording tip in relation to the diaphragm, the inspiratory deflection being pointed, and the expiratory deflection flattened.

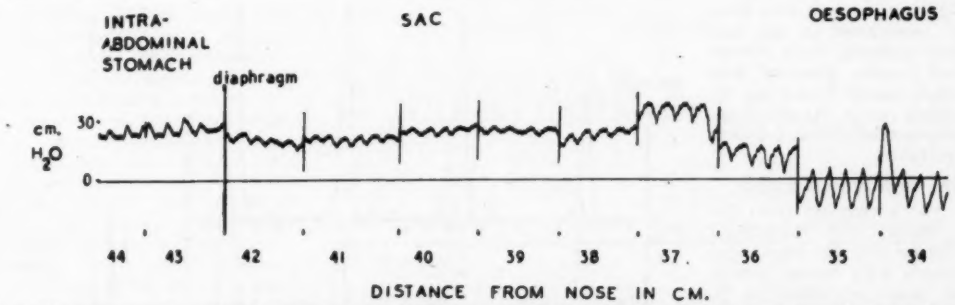


Fig. 2—Tracing of pressures in a patient with hiatus hernia as an open-ended tube is withdrawn in 1 cm. steps from the stomach, through the sac, into the œsophagus.

As in normal subjects, the direction of the respiratory-pressure swings indicates the position of the recording tip in relation to the diaphragm. The pressure within the sac remains at about the same level as that in the stomach below the diaphragm. There is a rise of pressure representing a barrier to reflux, at the œsophagogastric junction at the proximal end of the sac, 37 cm. from the nose. There is no rise of pressure at the diaphragm. Patient did not have symptoms of reflux.

positive in the abdomen, negative in the thorax, and commonly biphasic at the level of the diaphragm.

In the region of the diaphragmatic hiatus a rise of pressure occurred over a distance of 1–4 cm., extending about 1 cm. below and 2–3 cm. above the diaphragm (fig. 1). On swallowing, the pressure in this segment of gut fell to about the general intraœsophageal level, indicating that this band of high pressure represents a tonically contracted sphincter which relaxes as part of the swallowing reflex (Atkinson et al. 1957). This segment constitutes a barrier to reflux from the stomach into the œsophagus because in some parts of it both expiratory and inspiratory pressures were higher than those in the fundus. This pressure barrier to gastroœsophageal reflux was measured by subtracting the mean pressure in the fundus from the highest pressure in the sphincteric zone. All the pressures were measured at the end of expiration, because expiratory pressures do not fluctuate as much as inspiratory pressures with variations in the depth of respiration.

When a tube was withdrawn from stomach to œsophagus several times in the same person, the pressure in the sphincteric segment was found to vary much more than that in the fundus or in the œsophagus. This variation was attributed partly to difficulty in placing the tip of the tube accurately and to the tendency for it to be displaced out of the sphincteric zone, and partly to variations in the tone of the sphincter. For this reason a tube was withdrawn at least three times in each person, and the maximum difference between the pressures recorded in the sphincteric segment and the fundus was taken as the barrier to reflux. Our recordings were made with the subjects fasting and in the left lateral position, and the findings may not apply under different experimental conditions.

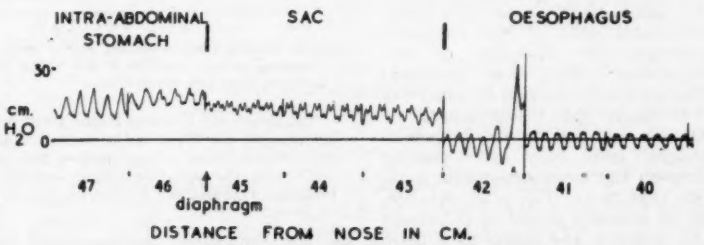


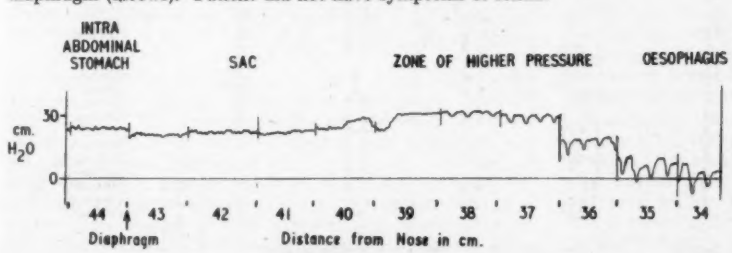
Fig. 4—As in fig. 2. Tracing from patient with hiatus hernia.

There is no rise in pressure at the œsophagogastric junction at the proximal end of the sac, and therefore no barrier to reflux. Immediately below the diaphragm the pressure rises little and remains at this level throughout the sac. Patient had symptoms of reflux.

In the group of 7 male students and staff aged 20–30 the barrier pressure varied between 6 and 15 cm. H_2O, (mean 9 cm. H_2O) (fig. 6). This is in close agreement with the figure of 10 cm. H_2O given by Fyke et al. (1956) for subjects aged 20–35. In the 8 patients with a normal

Fig. 3—As in fig. 2, tracing shows segment of higher pressure at œsophagogastric junction at the proximal end of the hernial sac shown in radiograph.

Note that the œsophagogastric junction lies several centimetres above the diaphragm (arrows). Patient did not have symptoms of reflux.



œsophagogastric junction who were chosen to correspond in age and sex to the patients with hiatus hernia the barrier pressure was 1–20 cm. H_2O (mean 11 cm.) (fig. 6). In the group as a whole there was no obvious relationship between age and pressure.

PATIENTS WITH HIATUS HERNIA

A tube was withdrawn from the stomach below the diaphragm through the sac into the œsophagus in 18 patients with hiatus hernia, using the same procedure as in the controls. In these patients, too, the position of the diaphragmatic hiatus could be identified by the direction of the inspiratory swings: in all of them, as the diaphragm was crossed and the recording tip entered the sac, the inspiratory deflection changed from positive to negative, and superimposed cardiac pulsations were often seen (figs. 2–4).

The Hernial Sac

After the tube had crossed the diaphragm, the expiratory pressure in the sac remained at about the same level as in the intra-abdominal part of the stomach, although the direction of the respiratory swing was reversed. The pressure remained at this level throughout the whole length of the sac and fell to the intraœsophageal level only after passing through the œsophagogastric junction (figs. 2–4). This interpretation of the pressure record as indicating the presence and limits of a hernial sac was prompted by the observation that, in patients with a fixed hernia, the length of the hernia on an X-ray film corresponded well to the distance above the diaphragm over which the subdiaphragmatic pressure was maintained (table I). It was confirmed by the finding that the length of tube required to reach the œsophagogastric junction at fluoroscopy corresponded to the distance on the tracing at which the pressure fell to the œsophageal level as the tube was withdrawn.

It became evident that, if the subdiaphragmatic pressure was maintained at a steady level for several centimetres above the diaphragm, a hiatus hernia must be present. By this means we were able to predict that 2 patients (cases 5 and 9) had a hiatus hernia, and this was subsequently demonstrated by radiography.

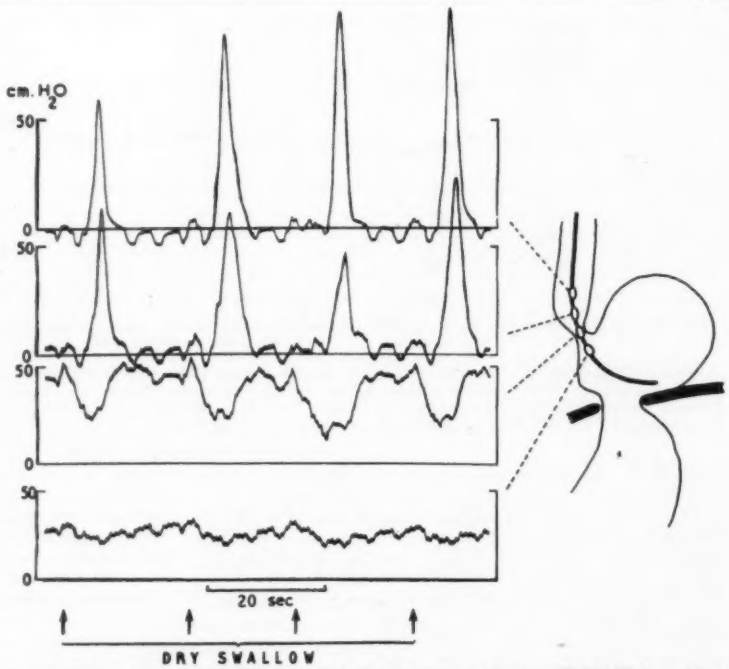


Fig. 5—Tracing from a patient with a fixed hiatus hernia and a zone of high pressure at the œsophagogastric junction 6 cm. above the diaphragm, showing that a transient fall in pressure occurs on swallowing.

Simultaneous tracings from four recording tips—the upper two lying in the œsophagus, the third in the zone of high pressure, and the fourth in the sac. When the patient takes a dry swallow the pressure in the high-pressure zone begins to fall before the peristaltic wave arrives at the two recording tips in the lower œsophagus. This patient did not have symptoms of reflux.

The Œsophagogastric Junction

As the recording tip was withdrawn from the sac into the œsophagus, the pressure rose in 13 of the 18 patients before it fell to the intra-œsophageal level (figs. 2 and 3). This band of higher pressure was 1–3 cm. long, and the highest rise of expiratory pressure above that in the sac was 2–18 cm. H_2O. During swallowing, this pressure fell temporarily in some of the patients (fig. 5), producing a

FINDINGS IN 18 PATIENTS WITH HIATUS HERNIA

No.	Age (yr.)	Sex	Symptoms of reflux	Pressure barrier (cm. H_2O)	Area of hernia on X-ray films (sq. cm.)	Estimated distance of cardia from diaphragm (cm.)		Rise of pressure at diaphragm (cm. H_2O)	Angle of entry of œsophagus into sac
						On tracing	On film		
1	52	F	No	8	65–75	6–7	7–8	10	Obtuse
2	59	F	No	16	55	6–7	7–8	0	Not seen
3	52	F	No	13	50–80	.. †	5–7	..	Acute
4	67	F	No	10	40–70	6–7	6–7	0	Acute
5	64	F	No	12	35	6–7	6–7	0	Obtuse
6	80	M	No	7	0–20*	2–3	0–6	0	Not seen
7	53	M	No	10	0–30*	..	..	0	Obtuse
8	41	M	No	18	2–5	1–2	3	10	Obtuse
9	64	F	Yes	2	0–15*	2–4	4	0	Acute
10	60	F	Yes	0	30–65	..	4–5	0	Acute
11	69	F	Yes	0	40	2–4	2–4	0	Obtuse
12	57	F	Yes	9	0–40*	..	0–8	..	Acute
13	53	F	Yes	0	0–40*	..	0–6	..	Obtuse
14	44	F	Yes	0	0–20*	..	0–6	..	Not seen
15	60	F	Yes	3	0–5*	..	0–2	..	Acute
16	68	M	Yes	3	15	2–5	3–4	3	Obtuse
17	72	M	Yes	2	10	4	5	0	Obtuse
18	53	M	Yes	0	0–10*	..	0–2	..	Obtuse

* Reducible hernia. † Tube could not be passed below diaphragm.

tracing which closely resembled that seen at the normal œsophagogastric junction, and indicating that this band of higher pressure represented a sphincter which relaxed as part of the swallowing reflex. In the remaining 5 of the 18 patients the pressure did not rise between the sac and the œsophagus (fig. 4), but in some of these a transient fall in pressure at the œsophagogastric junction on swallowing was demonstrated. Presumably in these patients the tone of the sphincter was not sufficient to create a barrier to gastroœsophageal reflux. It should, however, be emphasised that, as in the control, when a tube was withdrawn from the sac into the œsophagus several times, there was considerable variation of the pressure in the sphincteric segment.

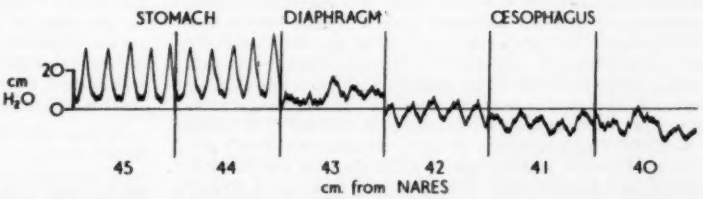


Fig. 7—Tracing after Heller's operation of cardiomyotomy in a patient with achalasia. There is no rise of pressure as the open-ended tube is withdrawn in 1 cm. steps from the stomach into the œsophagus.

A measure of the barrier to reflux was obtained by subtracting the pressure in the sac from the maximum pressure recorded in the sphincteric zone. A diagram was then constructed relating barrier pressure to the presence or absence of gastro-œsophageal reflux (fig. 6). It will be seen from fig. 6 that each of the 9 patients with a barrier of 3 cm. H_2O or less had symptoms of gastro-œsophageal reflux, whereas each of the remaining 9 patients had a barrier of 7 cm. H_2O or more, and in only 1 of these was reflux present. It therefore seems probable that, if the tone of the intrinsic sphincter remains normal, the patient with hiatus hernia is unlikely to have symptoms of gastroœsophageal reflux; but, if the tone of this sphincter is poor, reflux is likely to develop.

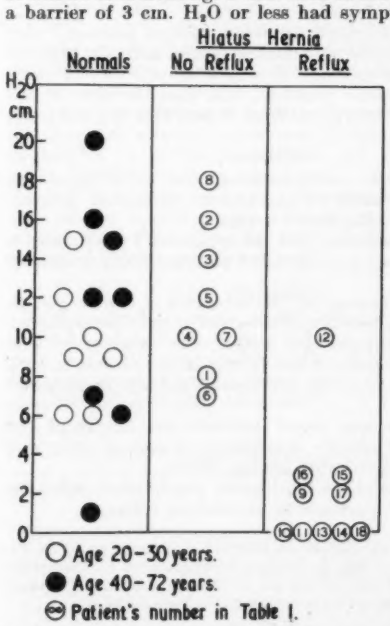


Fig. 6—Diagram showing relationship between symptoms of reflux and the height of the pressure barrier, at the œsophagogastric junction.

The pressure barrier was calculated by subtracting the expiratory pressure in the fundus or hernial sac from the maximum expiratory pressure at œsophagogastric junction.

In 5 of the patients with a fixed hiatus hernia (cases 1–5) the œsophagogastric junction was 5–8 cm. above the diaphragmatic hiatus both in a radiograph and as judged from the pressure tracing. In each of these patients a band of higher pressure was found at the œsophagogastric junction, with a barrier pressure of 8–16 cm. H_2O, and in some of them the pressure fell temporarily on swallowing, with the result that the manometric record of this segment was identical with that obtained from the œsophagogastric junction of a normal person. In these patients the distance of the œsophagogastric junction from the diaphragm indicated unequivocally that the sphincteric segment was quite separate from the diaphragm. There can be little doubt, therefore, that the band of higher pressure which we and Fyke et al. (1956) have interpreted as a sphincteric mechanism in the normal is largely, if not indeed wholly, due to an intrinsic sphincter.

The Diaphragmatic Hiatus

In contrast to the œsophagogastric junction, no localised increase of pressure was found at the diaphragmatic hiatus in most of the patients, and therefore there was no evidence that the right crus of the diaphragm was constricting the sac. Moreover the close correspondence between the expiratory pressure in the stomach below the diaphragm and the expiratory pressure in the sac indicated that there was little or no constriction at the diaphragmatic hiatus.

In 3 patients (cases 1, 8, and 16) however, the pressure rose at or immediately below the point at which the tip crossed the diaphragm, suggesting that in these patients the stomach was in some way constricted as it passed through the diaphragmatic hiatus.

Angle at Junction of Œsophagus and Sac.

The angle of entry was assessed from X-ray films taken at routine barium-meal examinations (see table) but could not be clearly defined in some patients, because the films had not been taken with this purpose in mind. It seemed that the angle was in part determined by the size of the sac: in general, the larger the sac the more acute was the angle.

So far as could be judged in these patients, an acute angle was no guarantee against symptoms of reflux (see table): in the 10 patients with reflux an acute angle was present in 4, and in the 8 patients without reflux the angle appeared to be obtuse in 4. In these patients, therefore, the angle of entry did not appear to be important in preventing reflux.

Discussion

The controversy about the mechanism which prevents reflux at the œsophagogastric junction has been focused on the relative importance of three factors: (1) compression by the right crus of the diaphragm (Jackson 1922, Allison 1951); (2) a valvular mechanism (von Gubaroff 1886, Dornhorst et al. 1954) possibly related to the oblique angle of entry of the œsophagus into the stomach (Collis et al. 1954, Marchand 1955); and (3) an intrinsic sphincter. Of these, the third has been regarded by many as the most doubtful; an anatomical sphincter has never been demonstrated convincingly, and some have denied its existence (Belsey 1952).

Manometric techniques have now established that there is a physiological sphincter at the œsophagogastric junction (Fyke et al. 1956, Botha et al. 1957, Atkinson et al. 1957). The sphincteric mechanism, however, could represent either the contraction of intrinsic circular muscle-fibres or external compression by the right crus of the diaphragm. In the normal subject it is difficult to

differentiate clearly between these two possible mechanisms, but in certain patients with a hiatus hernia conclusive evidence for the existence of an intrinsic sphincter has been obtained. In these patients a sphincteric mechanism comparable in every respect with that found in the normal subject was demonstrated at the œsophagogastric junction, although this was situated several centimetres from the diaphragmatic hiatus. Further evidence that the sphincteric mechanism is intrinsic was obtained by studying a patient with achalasia who had had a Heller's operation. The circular muscle-fibres had been incised down to the mucosa along the lower 7 cm. of the œsophagus and the upper 2·5 cm. of the stomach, and special care had been taken to avoid damage to the diaphragm. No rise of pressure could be demonstrated at the œsophagogastric junction after the operation (fig. 7), and the patient afterwards developed symptoms of reflux.

This finding also implies that compression by the diaphragm contributes little to the rise of pressure at the œsophagogastric junction in the normal subject. This conclusion is supported by the absence of any rise in intraluminal pressure at the level of the diaphragm in most of those patients in whom the œsophagogastric junction was clearly separated from the diaphragmatic hiatus, but it should be noted that the hiatus must have been severely stretched by the neck of the sac in many of these patients. Though the available evidence does not exclude the possibility that the "diaphragmatic pinchcock" may contribute in a minor degree to the rise of pressure at the normal œsophagogastric junction, there can be little doubt that an intrinsic sphincter is primarily responsible for this sphincteric mechanism.

The possibility of any significant compression by the diaphragm in patients with a hernial sac is excluded by the observation that the pressure in the sac usually corresponded to that in the fundus below the diaphragm and was always much higher than the intra-œsophageal pressure. This was a constant finding and has proved useful in determining whether a hernial sac was present when the pressures were measured. In 2 of our patients a hiatus hernia was first discovered in this way, although 1 of them had previously had a barium meal reported as normal.

These findings indicate that the "diaphragmatic pinchcock" is not important in maintaining the competence of the œsophagogastric junction. Many of our patients had never had symptoms of reflux though they had a large fixed hiatus hernia in free communication with the subdiaphragmatic stomach, and an œsophagogastric junction lying well above the diaphragm.

It was more difficult to assess the importance of the angle of entry of the œsophagus into the sac, but this was clearly obtuse in some patients who had never had symptoms of reflux. In such patients as these, therefore, the intrinsic sphincter seems to be the only factor which could prevent reflux. A normal pressure barrier was in fact demonstrated at the junction of the œsophagus and the hernial sac in the majority of the patients without symptoms of reflux, in contrast to those with symptoms, in whom the tone of the intrinsic sphincter was presumably too low to present a barrier to reflux. Even in these patients, however, there was an abrupt fall in pressure at the junction of the sac and the œsophagus, although a pressure barrier could not be demonstrated. This might possibly be explained by the presence of a valvular mechanism sufficient to prevent equalisation of pressures but not to prevent gastrœsophageal reflux. The barrier pressure varied from time to time and was usually higher in expiration than inspiration, but never amounted to more than a few centimetres of water. It is not, therefore, a constant value for an individual, but should be regarded as an index of the functional state, or tone, of the sphincter. All our recordings were made with the patient lying on the left side and fasting, but Fyke et al. (1956), by recording the pressure in the sphincteric zone of normal subjects in various positions, show that this pressure "is jealously maintained above gastric pressure in the face of circumstances which might appear to favour reflux."

Aylwin (1953) showed that, in many patients with hiatus hernia, considerable quantities of juice containing acid and pepsin can be aspirated from the œsophagus during the night; in others little or no aspirate was obtained. He related the presence of œsophagitis, as assessed by œsophagoscopy, to the quantity and acidity of the aspirate obtained. These findings led him to postulate that the cardiac sphincter retains a degree of competence in certain patients with hiatus hernia. Our pressure measurements provide direct proof that this is so. Braasch and Ellis (1956) have demonstrated the importance of some intrinsic mechanism at the œsophagogastric junction, rather than any action of the "diaphragmatic pinchcock," in preventing reflux œsophagitis in the dog. They performed various operations on the œsophagogastric junction, including excision, and Heller's or Wendel's cardiomyotomy, with or without displacing the cardia into the thorax or the abdomen several inches above or below the diaphragm. They found that, if the œsophagogastric junction was incised or excised, œsophagitis usually developed, whereas it did not do so if the junction was intact, whatever its final position. Our findings in patients with hiatus hernia indicate that, in man too, the diaphragm does not effectively compress the œsophagogastric junction, and that the tone of the intrinsic sphincter is of cardinal importance in preventing reflux.

Summary

The sphincteric mechanism at the œsophagogastric junction was studied by manometry in normal subjects and in patients with hiatus hernia.

Evidence is adduced that the sphincteric mechanism is intrinsic and does not represent external compression by the diaphragm.

The pressure exerted by the sphincter at the œsophagogastric junction constitutes a barrier to gastrœsophageal reflux. A measure of this barrier was obtained by subtracting the pressure in the fundus of the stomach, or in the hernial sac, from the pressure in the œsophagogastric junction.

A correlation was found between the height of this pressure barrier and the presence or absence of symptoms of reflux in patients with hiatus hernia.

It is concluded that the tone of the intrinsic sphincter is of cardinal importance in preventing reflux.

We wish to thank Dr. K. E. Harris for allowing us to use the X-ray facilities of the cardiological department at University College Hospital, and Prof. R. S. Pilcher and Dr. F. Avery Jones for allowing us to investigate their patients.

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CONTROL OF ARTIFICIAL RESPIRATION IN POLIOMYELITIS PATIENTS WITH PARALYSIS OF SWALLOWING

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POLIOMYELITIS patients with respiratory failure who develop also failure of swallowing cannot be satisfactorily treated simply by putting them in a tank respirator. Their airway becomes obstructed, sometimes suddenly, sometimes slowly. To prevent this Galloway (1943) used tracheotomy. Lassen went a step further and introduced positive-pressure respiration through the tracheotomy tube (Lassen and Lindahl 1953, Lassen 1953) and this is the method which has been in use in this hospital (Macrae et al. 1954) and elsewhere in Great Britain.

This treatment has been introduced to maintain respiration in those patients who are in danger of dying from asphyxia. Before tracheotomy they often have partial obstruction of the airway and even collapse of the lung. But even after tracheotomy collapse is still likely owing to increased secretion and other factors. Bronchial spasm may develop, which calls for high inflation pressure. These patients, therefore, are difficult subjects for artificial respiration, and their condition throws into prominence the need for accurate assessment and so control of respiration.

At the introduction of positive-pressure respiration in this hospital clinical assessment alone was used. Its limitations soon became clear, and other solutions of the problem were sought. These took some time to develop, and seven bulbo-respiratory cases were treated with mainly clinical control. Twelve patients have been studied since then. The methods used and their results in nine of these are reported here.

Methods

Four methods were used—spirometry, blood-gas analysis, estimation of end tidal carbon-dioxide concentration, and chest radiography. They were used in conjunction with each other, and the results were compared with clinical assessment.

Spirometry

The tidal air and respiration-rate were measured and compared with the figures predicted by the nomogram prepared by Radford et al. (1954). The construction of the positive-pressure machines in use made it a simple matter to pass the air from the expiratory port into a gas-meter or a Hutchinson-type spirometer. Some of the air so obtained may not have come from the patient, but the amount would be small and, being constant, it would not be significant when ventilation was compared with blood-gas figures.

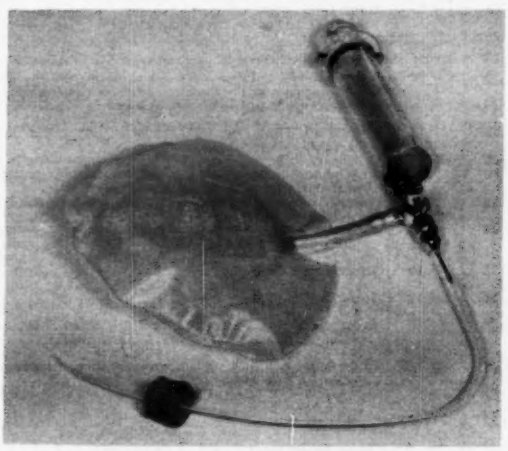

Fig. 1—Apparatus for collection of end tidal sample of air.

Blood-gas Analysis

The blood was obtained from the femoral or less commonly the brachial artery. The sample was kept at body-temperature and the pH measured within half an hour. A Cambridge Instrument Company bench-type meter, Stadie electrode chamber, and a water-bath at 37° were used in conjunction with buffers electrometrically tested to pH 7·35 and 7·44, ± 0·01. Total carbon-dioxide content was measured by the Van Slyke manometric method. Duplicate measurements were made in both cases. The carbon-dioxide tension was calculated from the Henderson-Hesselbach equation. The inaccuracy of the method lies in the measurement of pH, as has been emphasised by Severinghaus et al. (1956). Probably the maximum error claimed for the meter, ± 0·02 pH, unit was often exceeded. Improved buffer and meter which give results to 0·005 pH have been described by Wynn and Ludbrook (1957). The oxygen saturation of the arterial-blood samples was estimated with a reflecting curette oximeter made by Kipp (Zijlstra 1953).

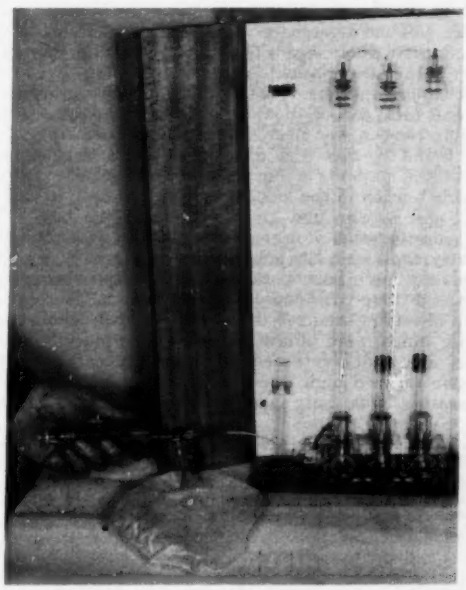

Fig. 2—Carbon-dioxide meter.

Estimation of End Tidal Carbon-dioxide Concentration

An end tidal sample was obtained by drawing off 5–8 c.cm. of air from the trachea at the end of expiration with a well-fitting all-glass 20-ml. syringe and passing it into a polyethylthene bag (fig. 1).

100–150 c.cm. was collected in a minute and the carbon-dioxide concentration estimated immediately. A simple carbon-dioxide meter devised by Ainsworth (1953) was used (fig. 2). The principle of the meter is that 25 c.cm. of gas is passed through soda-lime, and the resulting decrease in volume is measured. The volume of gas is measured by a soap film running in a standard 25 ml. laboratory burette. The method was checked against a standard Haldane apparatus and its error found to be ± 0·2%. This degree of accuracy was considered sufficient. The speed and simplicity of the method made it very suitable for use at the bed-side. Estimations were always done in duplicate.

Chest Radiography

Chest radiographs were taken daily for the first few days after tracheotomy and then less frequently.

In addition to the above observations, note was taken of the pressures required for inflation of the lungs.

Results

The results are set out in the accompanying table.

It is the aim of any form of artificial respiration to provide the tidal air and respiration-rate which oxygenates the blood to 98% saturation and keeps the arterial carbon-dioxide concentration at 40–42 mm. Hg, and these are the standards by which these results are judged. In addition it is desirable to provide this ventilation with the least disturbance of cardiac output, though this is not the concern of this paper.

Spirometry.—The ventilation which proved satisfactory was greatly in excess of that predicted by the Radford nomogram in cases 1, 4, 7, and 8. These patients had gross collapse of the lungs shown in the chest radiograph, and the divergence varied directly with the degree of collapse. There was a fair correlation with the nomogram in the other patients with normal lungs.

Blood-gas analysis.—There was a wide variation of pH and total carbon-dioxide content, even when carbon-dioxide tension was near normal. The lowest pH, 7·15, was found in case 1 a day before death from anuria. In all the patients a normal, or near normal, carbon-dioxide tension in the blood was achieved even in cases 1, 4, 7, and 8, who had gross collapse of the lung. The oxygen saturation, however, in these four cases remained slightly depressed, the lowest figure being 86% in case 8. This may have been because blood passed through the collapsed lung without being aerated. The opposite state of affairs occurred in case 4. Initially the patient, whose lungs were almost clear radiographically at the time, was underventilated. The arterial carbon-dioxide tension reached high levels, 95 mm. Hg, but the oxygen saturation was only slightly depressed. Additional oxygen was always administered to these patients during the early stages. It is likely that this raised the oxygen tension sufficiently to maintain fair saturation, because the initial fall of oxygen tension affects the dissociation of oxyhæmoglobin to a small extent only.

End tidal carbon-dioxide concentration.—In cases 1, 4, 7, and 8, who had gross collapse of the lungs, the end tidal carbon-dioxide tension was always lower than, and bore no constant relation to, the tension in the arterial blood. In the other patients the values were as nearly equal to one another as the methods allowed.

Chest radiography.—Collapse of the lung, as noted above, was often present. When slight or moderate it was not detectable clinically.

Inflating pressures.—When the lungs were clear, pressure of about 8–14 cm. of water was sufficient to provide a satisfactory ventilation. When there was extensive collapse of the lung, a pressure of 25–30 cm. of water was necessary to provide the greater minute volume. Sometimes this need for high pressures was associated with rhonchi in the chest. When the rhonchi disappeared, lower pressures were satisfactory. This suggested the bronchial spasm was present.

Clinical assessment.—The above figures demonstrating underventilation were obtained from patients who showed no definite clinical signs of this condition. Case 4, with a carbon-dioxide tension of 95 mm. Hg, though slightly confused mentally, was not flushed or sweating, and his blood-pressure was little raised, 145/80 mm. Hg. Case 2, with a low carbon-dioxide tension, 25 mm. Hg, also showed no sign of disturbance.

Discussion

The value of blood-gas analysis in the assessment of respiratory state in patients receiving positive-pressure

ANALYSIS OF RESULTS

Case no.	Date	Minute volume (litres)		Oxygen saturation (%)	pH	Total CO_2 (vols. %)	Carbon-dioxide tension (mm. Hg)		Inflating pressure (cm. H_2O)	Chest radiograph
		Observed	Predicted				Blood	End tidal		
1	Oct. 3, 1956	9·5	9·9	94	7·34	69·0	59	52	+30	Partial collapse right upper lobe, extensive collapse left lower lobe
	,, 5, ,,	11·0		85	7·55	82·0	43	35		As above
	,, 8, ,,	14·5		82	7·55	87·0	47	32		As above with partial collapse left upper lobe
	,, 11, ,,	14·5		84	7·45	72·0	49	32		Right upper lobe collapse decreased, right lower lobe now partially collapsed
	,, 13, ,,	14·5		82	7·38	65·0	50	29		As above
	,, 15, ,,	16·0		90	7·35	52·0	42	30		As above
	,, 18, ,,	16·0		92	7·15	34·0	42	29		
2	Oct. 10, 1956	9·5	6·0	100	7·55	48·0	24	24	+7	Lung fields clear
	,, 19, ,,	5·4		100	7·48	59·0	36	38		
	Nov. 1, ,,	7·0		98	7·46	59·0	37	35		
	,, 29, ,,	7·0		100	7·52	57·0	32	32		
3	Jan. 30, 1957	5·2	4·4	99	7·43	57·0	39	30	+14	Considerable collapse left lower lobe, emphysema left upper lobe
	Feb. 9, ,,	5·6		96	7·42	69·5	50	39		Partial collapse of both lower lobes
4	Mar. 31, 1957	8	7·7	93	7·30	99·0	95	65		March 30, 1957, minimal collapse left lower lobe, elevation of right diaphragm
	April 1, ,,	11		93	7·50	79·0	46	36	−5 +20	
	,, 4, ,,	11		94	7·39	64·0	47	36		Further collapse of left lower lobe, lobular collapse and consolidation right lower zone
	,, 13, ,,	14		98	7·47	57·0	35	25		Some collapse of apical segment right upper lobe and left lower lobe
	,, 14, ,,	14		98	7·52	52·0	29	21		May 13, 1957, collapse of left lower lobe, lobular collapse right lower zone
5	May 8, 1957	8	7·2	100	7·48	56·0	34	35	+10	Lung fields clear
6	April 27, 1957	6	4·5	95	7·56	75·0	39	39	+12	Lung fields clear
7	July 10, 1957	11·2	8·0	98	7·33	51·5	43	30		Collapse of anterior segment right upper lobe, consolidation and collapse right lower zone
8	May 15, 1957	19·5	11·0	94	7·30	78·0	78	57	−5 +27	Complete collapse right upper lobe, segmental collapse left lower and upper lobes
	,, 18, ,,	22·4		86	7·44	62·0	40	30		
	,, 22, ,,	21·0		..	7·41	63·0	45	..		
	,, 26, ,,	18·0		90	7·44	69·0	47	31		
9	Aug. 12, 1957	9·2	7·7	99	7·54	60·3	32	31	+ 8	Lung fields clear

ventilation has been emphasised before (Astrup et al. 1954, Linderholm 1956). The results described above show that it is indispensable for those who have collapse of the lung. In practice arterial puncture need not be done often, because the blood-gas figures can be related to those obtained by spirometry. So long as there is no change in the condition of the lungs, as shown by radiography, spirometry can provide a satisfactory substitute. Spirometry used in this way can provide an accurate check on respiration from hour to hour.

The end tidal carbon-dioxide concentration, measured with an infra-red meter, has been used satisfactorily in poliomyelitis patients with normal lungs in a cuirasse or tank respirator (Collier and Affeldt 1954). The same method has been used by Crane et al. (1956) for patients with a tracheostomy in a tank respirator. They found low carbon-dioxide tensions in many cases which they concluded were due to overventilation. Although arterial blood pH was measured in some cases, arterial carbon-dioxide tensions were not mentioned, and it is possible that in some cases the low end tidal tension was due to collapse of the lung. Linderholm (1956) notes the same discrepancy between end tidal and arterial-blood carbon-dioxide tension in a patient who had some consolidation of the lung. As a ward technique the method described here was satisfactory. Used in conjunction with the other methods it provided valuable evidence of disorders of gas exchange in the lungs, but used alone it did not provide accurate assessment of respiration.

During this study the value of chest radiography was increasingly made clear. Only by radiography was it possible to detect collapse of the lung before this became gross and difficult to relieve. Radiography also explained the other findings. Screening in the ward with an image intensifier may perhaps permit detection of decreased ventilation heralding collapse of the lung.

Summary and Conclusions

Purely clinical assessment of the efficiency of positive-pressure respiration was unsatisfactory in seven cases of bulbo-respiratory failure.

Four laboratory methods—spirometry, blood-gas analysis, estimation of carbon-dioxide concentration in the end tidal air, and chest radiography—were introduced to supplement the clinical observations. The results obtained from their use in nine cases are given.

When the lungs are radiographically normal, the estimation of end tidal carbon-dioxide concentration provides a delicate and accurate assessment of respiration in a poliomyelitis patient. In these cases, too, spirometry forms a quick simple method, accurate enough if one errs on the side of overventilation. But, if there is collapse of the lungs, blood-gas analysis is the only method which can give an accurate answer.

I wish to thank Dr. J. Macrae for much help with this work, and Dr. G. K. McGowan, Mr. H. Williams, Mr. L. Hough, Mr. J. Wilcocks, and Mr. J. H. Burrow for assistance in the laboratory. Some of this work was included in a thesis presented for the degree of doctor of medicine at Cambridge.

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ISLET-CELL TUMOUR OF THE PANCREAS WITH PEPTIC ULCERATION, DIARRHŒA, AND HYPOKALÆMIA

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THE association of non-insulin-secreting islet-cell tumours of the pancreas with peptic ulceration has been reported by Zollinger and Ellison (1955), who refer to other reports of a similar syndrome. Some of these patients have had long-continued diarrhœa, and we report here a case in which intractable watery diarrhœa persisted for a year, and led to exceptionally severe potassium depletion and ultimately to death.

Case-report

A married woman, aged 56, was first seen in 1949 complaining of left-sided abdominal pain for two years. At laparotomy a tumour in the body and tail of the pancreas was excised. Histologically, this proved to be an islet-cell tumour. After this she remained in satisfactory health till 1953, when epigastric pain developed, radiating to the right hypochondrium and interscapular area, with flatulent distension, vague discomfort after food, and occasional vomiting. She had not lost weight. Motions were described as sometimes pale, but otherwise normal. In July, 1954, more severe pain, with gall-bladder tenderness and slight jaundice, led to cholecystectomy; an inflamed gallbladder, containing multiple stones, was removed; the pancreatic remnant appeared normal. She recovered well from this operation.

Early in 1955, she began to have a watery diarrhœa which persisted unrelieved by the usual remedies. Bacteriological examination was negative, and there was nothing to suggest pancreatic deficiency. After three months of intermittent diarrhœa, she complained of anorexia, nausea, occasional vomiting, upper abdominal pain, and a high retrosternal pain unrelated to food. There had twice been traces of bright blood in the motions. General examination revealed nothing definite; her condition was quite good and she was not anæmic. Barium meal and barium enema examination, sigmoidoscopy, fat-balance studies, and blood were normal.

On admission to hospital in June, 1955, she was thin and dehydrated. There was tenderness on deep palpation in the epigastrium. The blood-pressure on admission was 110/70 mm. Hg; she was only just able to walk short distances in the ward, and was passing daily from four to six brown watery motions, with occasional mucus, containing no pathogens in repeated specimens. Hæmoglobin was 15 g. per 100 ml., blood-urea 60 mg. per 100 ml. Low, irregular pyrexia to 99·6°F continued for about ten weeks; her weight on admission was 8 st. 3 lb., and fell 8 lb. in the next six weeks. She had persistent sodium and potassium deficiency. Serum-potassium was 1·8 mEq. per litre on admission, and did not exceed 3·2 mEq. till July 22 when, after protracted intensive treatment, including potassium chloride in daily doses up to 16 g. orally and 12 g. intravenously, it reached 5·8 mEq. per litre—a level which could not be maintained. Electrocardigrams showed a prolonged QT interval and flat or negative T waves. She had, also, severe sodium-depletion, the serum-sodium ranging from 117 to 126 mEq. per litre. During this period, the urinary sodium level was negligible or absent, but an estimation of fæcal excretion gave sodium 73 mEq. and potassium 74 mEq. per litre.

Throughout this period, she remained prostrated, with blood-pressure between 90/60 and 100/70 mm. Hg, and continued to have diarrhœa, losing by this route up to 5·2 g. of potassium in a day. Succinylsulphathiazole, kaolin and morphine, and streptomycin had no effect on the diarrhœa.

The drain on her electrolytes caused by the diarrhœa and vomiting continued unabated, and on July 29, despite the risk of further potassium depletion, cortisone 100 mg. daily was given. Almost at once vomiting ceased, and the stools became less frequent and thicker in consistency, some being semi-formed. There was a dramatic general improvement in

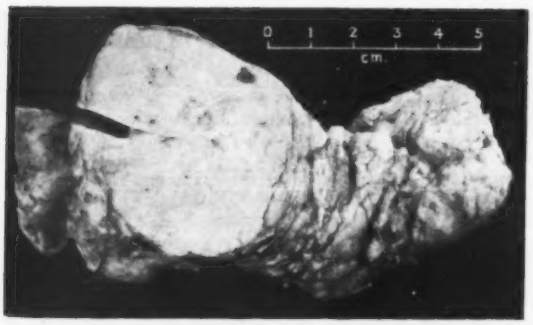

Fig. 1—The tumour in the truncated pancreas.

her physical condition, but on Aug. 3 she vomited about three litres of almost pure blood, and cortisone was immediately discontinued. She responded well to transfusion, and from this point all treatment, except vitamins and iron, was discontinued; her condition continued to improve steadily, though the stools again became looser and more frequent, but never so bad as before cortisone treatment, and the serum-sodium remained at 130 mEq. per litre or just over. Potassium, however, again fell to about 3·3 mEq. per litre. A barium meal showed a large shallow ulcer on the lesser curve.

She was discharged at her own request on Sept. 14, having gained 11 lb. in weight, though still having three to four loose motions daily. She was, however, readmitted on Oct. 26 with increasing diarrhœa and further vomiting.

She was drowsy, dehydrated, and thirsty; could take no solid food, and was passing up to nine pale watery motions daily. Pulse and temperature were normal, but blood-pressure was 85/65 mm. Hg. The serum-sodium was 120 mEq. per litre, potassium 3·2 mEq., chlorides 82 mEq., alkali reserve 22 mEq., and blood-urea 25 mg. per 100 ml.

For the next three months her condition remained substantially unchanged. A further barium meal and barium enema revealed no definite abnormality, though the colon showed some loss of normal haustration. Repeated bacteriological examination of stools was negative, and there was no excess of fat. Sigmoidoscopy was normal. The patient continued to vomit at intervals and complained of persistent giddiness. Blood-pressure averaged 80/50 mm. Hg, but urinary output remained adequate.

Despite a variety of corrective measures, it was clear that the incessant loss of electrolytes in the fæces could not be made up, and the patient was likely to die from exhaustion; it was therefore decided, notwithstanding the previous episode of hæmatemesis, to risk giving cortisone again. Beginning in February, 1956, she was given 50 mg. daily by mouth, increasing gradually to 125 mg. (intramuscular when vomiting was persistent). She immediately improved, and became physically stronger and less nauseated; her blood-pressure slowly rose. The stools became less fluid and less frequent, falling gradually to two or three daily. From a state of depression or apathy she became alert and more hopeful, and appeared just fit enough for laparotomy, which was done on March 19 in an attempt to find the cause for the diarrhœa. There was a small amount of free fluid in the peritoneum and slight reddening of the lower descending colon, but no other abnormality was found. Extensive search was not practicable owing to her poor condition.

She recovered well from laparotomy. By the end of March she was eating solid food, and in mid-April could sit out of bed and even walk a little. She had now been six months in hospital, and, having thus made a remarkable improvement, begged to be discharged. She left hospital on May 22, taking cortisone 50 mg. and potassium chloride 4 g. daily. Her weight had risen from 5 st. 8 lb. to 7 st. 8 lb. On June 4, her condition appeared to be maintained, though she had lost 4 lb. in weight; she was not sick, she was eating fairly well, and giddiness had much improved. She still passed two or three fluid motions daily, but not at night. Cortisone was reduced to 37·5 mg. daily. A fortnight later some deterioration was obvious; she had lost appetite and a further 8 lb. in weight. Cortisone was increased to 50 mg. daily. By July 12, she was as bad as ever, the combined volume of fæces and urine (she was now incontinent) reaching 6–7 litres in twenty-four hours. Serum-sodium was 100 mEq. and potassium 1·8 mEq. per litre. Intensive therapy temporarily improved these figures, but on July 18 a left popliteal-artery developed thrombosis, and gangrene rapidly followed. Mid-thigh amputation was done under refrigeration; the immediate postoperative period was survived remarkably well, but she died on Aug. 4.

Necropsy

The examination was performed 48 hours after death. The body was emaciated; the amputation wound was healing. There was diffuse light brown pigmentation of the skin. The principal findings of interest were confined to the alimentary system. The tail of the pancreas had been removed surgically; the body contained a rounded encapsulated tumour about 5 cm. in diameter (fig. 1). Its cut surface was creamy-white and it had approximately the consistency of brain. The tumour was adherent to the posterior wall of the stomach. The head of the pancreas appeared intact. The œsophagus, stomach, and intestines appeared entirely normal. Apart from slight fatty infiltration, the liver was normal. The gall-bladder was absent and the bile ducts normal.

Microscopy

Pancreas (figs. 2 and 3).—The tumour was composed of trabeculæ and solid acini of cells with a relatively abundant, faintly eosinophilic and finely granular cytoplasm and vesicular nuclei which tended to a basal localisation. The nuclei were for the most part similar in size, but there was a small proportion of swollen cells in which the nuclei were bloated and had a fine, dust-like chromatin and prominent nucleoli. About 1% of the cells contained in their cytoplasm clusters of granules varying in size from the limits of visibility to about

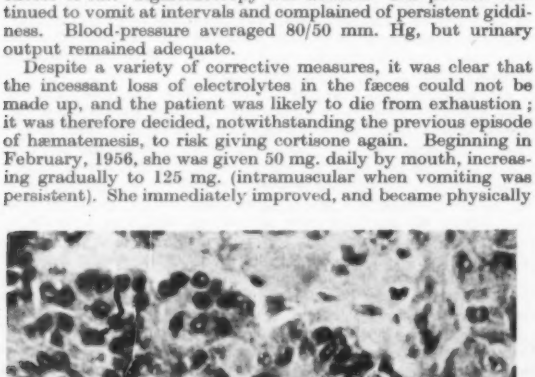

Fig. 2—To illustrate the trabecular and acinar structure of the tumour. (Hæmatoxylin and eosin. ×500.)

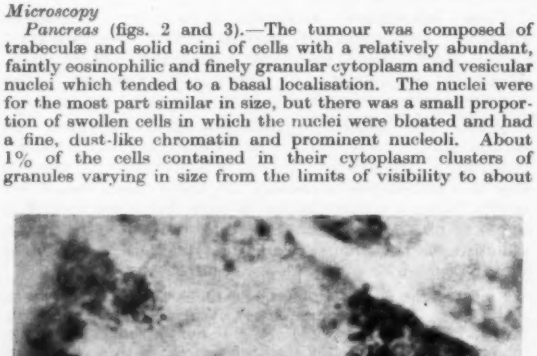

Fig. 3—Clusters of intracellular granules in occasional tumour cells. (Goodpasture's stain. ×2000.)

1 μ in diameter. These stained bright red with Mallory's and Goodpasture's stains.

The tumour had a thin fibrous capsule, through which, however, there was invasion in several places. Invasion extended into the muscularis of the stomach at the point of adherence. Sections of the tumour removed in 1949 showed a fundamentally similar structure, except that cytoplasmic granules were not seen.

The surviving pancreatic tissue showed no abnormality. None of the other organs examined appeared significantly abnormal.

Discussion

Zollinger and Ellison observed 2 cases of jejunal ulceration with extremely high gastric acidity; at operation in one, and at necropsy in the other, a non-beta-cell adenoma was found in the pancreas. They refer to four other examples (unpublished) of a similar triad. 1 of their patients had severe watery diarrhœa following resection of a jejunal ulcer, and of the 4 patients quoted, 1 had severe intermittent diarrhœa. This symptom does not appear to have been an essential feature of the syndrome, and its relationship is obscure.

The ulcers have typically been in less common situations, such as the upper jejunum, or have been at the site of a surgical anastomosis; they have usually been recurrent over a period of years, and associated with a high uncontrollable gastric acidity. In the 6 examples of this syndrome where the sex has been stated, the sufferers have all been women, their ages ranging from 16 to 74. Hyperinsulinism is not a feature of the condition. The tumour cells in most cases do not contain recognisable granules, except that in the tumour described by Brown et al. (1950) granules of alpha-cell type were present in many of the cells. The tumours may be single or multiple, and the majority appear to have been either locally invasive or frankly metastasising. Our patient had no clear evidence of peptic ulceration up to the time of her hæmatemesis, which may well have been precipitated by cortisone therapy. Radiographic examination a month after the hæmorrhage suggested the presence of a healing acute ulcer, but we cannot claim that this case is typical of those previously reported in that there was no suggestion of chronic ulceration either in the history, at operation, or at necropsy. Moreover, no gastric analysis was done, so hyperacidity was not shown to be present. Seven years before death an islet-cell tumour of the pancreas had been removed; the abdomen had been re-opened on two later occasions and no further tumour discovered.

At no time in the course of the illness was there any evidence of hyperinsulinism; thus, though no glucose-tolerance tests were done, it would appear that the tumours were not secreting insulin. The tumour removed in 1949 was devoid of any features suggestive of hormone production, and in particular no cytoplasmic granulation was present. That removed at necropsy, on the other hand, did show a small proportion of cells with granules having the staining characteristics of alpha-cell granules. The part played by glucagon, if any, in the syndrome described by Zollinger and Ellison is still obscure. Poth et al. (1948) suggested the possible existence of an ulcerogenic agent of pancreatic origin.

The outstanding problem in the management of this case was to stem the persistent drain of sodium and potassium in the stools; this was never accomplished. Normal levels of serum-electrolytes were rarely achieved, even for periods of twenty-four hours, and even then only by massive intravenous therapy, e.g., 12 g. daily. The daily volume of stools and urine could not be measured separately, except for brief periods by catheterisation, but the total volume of both for six months varied from 1·5 to 2·5 litres, with a mean of 2 litres and an estimation of fæcal potassium alone at 290 mg. per 100 ml. would represent a daily loss of 6 g. In the last phase, separate estimates of urinary and fæcal potassium on one day alone showed a loss of 5·4 g. and 12·7 g. respectively. On this day the intake of potassium was 15·5 g. by gastric drip, a route which was clearly ineffective. This woman survived for nearly a year with serum-potassium mean levels of the order of 3·3 mEq. per litre, with even lower figures on many occasions; when she first came under our care, it was 1·8 mEq. The use of cortisone under these circumstances was on both occasions in the nature of a desperate measure, in view of the risk of further potassium loss; the hæmatemesis after four days of cortisone therapy on the first occasion was entirely unforeseen and compelled withdrawal of the drug; but the immediate improvement following its use on this occasion led us to accept the risk of using it again later when the continued diarrhœa, resistant to treatment, brought us to a final therapeutic impasse.

Summary

A further example is reported of the association between non-insulin-secreting islet-cell tumour of the pancreas and peptic ulceration, as described by Zollinger and Ellison (1955). In this case diarrhœa with extreme potassium depletion was the presenting, indeed the dominating, feature, and ultimately the cause of death.

Acknowledgments are due to Mr. E. Gordon Dingley, F.R.C.S., who performed the operations, and Mr. T. P. Whitehead, F.R.I.C., for many biochemical estimations.

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SEVERE CONGENITAL METHÆMOGLOBINÆMIA IN AN INFANT

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CONGENITAL methæmoglobinæmia is a rare inborn error of metabolism which is usually familial. During recent years only thirteen affected families and a number of isolated patients have been recorded. Only three of these patients have been treated in early infancy (Schwartz and Rector 1940, Dine 1956). We record here a further case of unusual severity which was successfully treated from the age of 5 weeks, and discuss the incidence of oligophrenia and its bearing on early diagnosis.

The causes of methæmoglobinæmia in infancy include drugs taken by mouth (e.g., sulphonamides), the ingestion of nitrates in drinking water (nitrates are converted into nitrites in the intestine) (Ewing and Mayon-White 1951, Everley Jones 1951, Campbell 1952), and the accidental ingestion of sodium nitrite (Oppé 1951). Aniline derivatives may also cause methæmoglobinæmia by their direct ingestion as wax crayons (Jones and Brieger 1947, Clark 1947), as disinfectants containing nitrobenzene (Stevens 1928), or as pure aniline in chemistry classes (Sterning 1951). They may also cause methæmoglobinæmia by indirect absorption through the skin as aniline dye in ink used to mark napkins (Rayner 1886, Graubarth et al. 1945, Kagan et al. 1949, MacMath and Apley 1954). Finch and Lorber (1954) described a breast-fed newborn in whom drowsiness, anæmia, hæmorrhages, and methæmoglobinæmia were thought to be the result of phenacetin "and/or" phenobarbitone taken by the mother during the pregnancy and puerperium, and ingested in the milk by the infant.

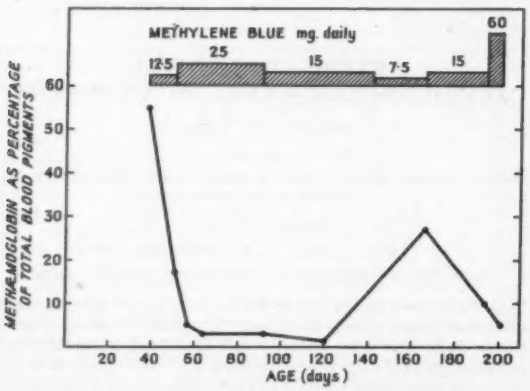
Case-report

A 36-hour-old male infant was transferred to this hospital on Dec. 4, 1956, from a maternity home. He was a first child, and was born at full term weighing 7 lb. 4 oz. after a normal pregnancy. Both parents were normal, the mother had not been taking any drugs, and there was no family history of cyanotic disease or mental retardation. The parents are unrelated.

At birth, the baby was noted to be blue but cried well, and clinically the lungs were fully expanded. The colour was only slightly improved by oxygen. On admission to hospital, the child was afebrile, deeply cyanosed, and very irritable, but not distressed. The pulse was rapid but regular, and the heart not clinically enlarged; no cardiac murmurs could be heard, and the femoral pulses were present and synchronous with the radials. The breath sounds were normal. The liver was normal in size, the spleen was not palpable, and there was no peripheral œdema. X-rays showed normal heart and lung shadows, and the urine was normal.

At first the infant was thought to have cyanotic congenital heart-disease, but, in view of the lack of positive evidence of heart-disease, the adequate aeration of the lungs, and the absence of distress, it was decided to examine the blood for methæmoglobin. The blood was a chocolate hue, and the colour was not changed by shaking with air. The total blood-pigments were equal to 14·5 g. hæmoglobin per 100 ml., of which 55% (8 g.) was methæmoglobin when determined by the method of Gibson and Harrison (1947). Blood from the parents was also examined for methæmoglobin, but none was found.

Treatment was immediately started with oral methylene-blue, 12 mg. daily (see accompanying figure) and within 6 hours the child's colour had become pink. 13 days later the methæmoglobin content had fallen to 17%, and the dose of methylene-blue was increased to 25 mg. daily. 6 days later the methæmoglobin had fallen to 5%, and a week later it was 3%. At this point the dose was reduced to 15 mg. daily and then to 7·5 mg. daily because of vomiting, and the methæmoglobin rose to 27%. A return to 15 mg. daily brought the level down to 10%, and a further increase to 60 mg. daily has caused a fall to 5%. The latest dose of 60 mg. daily has been given as half a tablet twice a day, and the baby has taken this more easily than the liquid form in which the drug was previously prescribed.



Effect of oral methylene-blue on the methæmoglobin level.

The child is now 7 months old and weighs 16 lb. 4 oz. He continues to vomit a little every day, and has done so since birth. At one point we were inclined to feel that this symptom was related to the methylene-blue, but it seems more likely to be a form of habit-vomiting and has not prevented a normal weight-gain. He is cheerful, looks well-covered though somewhat flabby, and has an alternating strabismus which is exaggerated by wide epicanthic folds. There is a faint greyish tinge to the skin which is insufficient to be appreciated by the casual observer. He can support his head well but makes no attempt to sit up.

An assessment of the development quotient on the Ruth Griffiths scale at the age of 6½ months (on June 24, 1957) gave a reading of 69, made up of the following sub-scales: locomotor 77, personal social 77, hearing and speech 58, eye and hand 72, performance 63. This shows a moderate, but fairly evenly distributed, retardation in development.

Discussion

There is no general agreement on the ætiology of the condition. Dieckmann (1932) postulated the presence of some unknown substance capable of oxidising hæmoglobin, and showed that the plasma did not contain the responsible factor. On the other hand, Lian et al. (1939) suggested that congenital methæmoglobinæmia is caused by an abnormal resistance of oxidised hæmoglobin to reduction. Gibson (1948), who has done much work on the subject, says that small amounts of methæmoglobin are constantly being formed in normal persons by the oxidation of hæmoglobin. The methæmoglobin thus formed is again constantly reduced under the influence of the so-called reduction system, consisting of coenzyme I (containing nicotinamide) and diaphorase I (containing riboflavine and a protein) within the red blood-cell. He says that the red cells in congenital methæmoglobinæmia are deficient in diaphorase-I activity, and therefore unable to keep the reduction rate of methæmoglobin at the required level. Consequently methæmoglobin accumulates in the red cells. This does not mean that methæmoglobin in the blood rises indefinitely, for the process is checked by a compensatory rise of reducing agents, such as ascorbic acid, in the blood, and equilibrium is obtained after 10–40% of hæmoglobin has been oxidised. Eggleton and Fegler (1952) suggested that the glutathione in the red blood-cell was responsible for the maintenance of intracellular methæmoglobin at a low level, and that a deficiency of this substance might play a part in the ætiology of congenital methæmoglobinæmia.

In most genealogical trees, the morbid trait is transmitted as a dominant (Coudonis 1948, Lutembacher 1949, Baltzan and Sugarman 1950), but in the family reported by Coudonis (1952), it seemed to be transmitted as a recessive. Gibson and Harrison (1947) found five patients with cyanosis in a family of nine, in whom transmission was as a recessive character, and they and their coworker (Breakey et al. 1951) believe that hereditary methæmoglobinæmia is inherited as a recessive character. Transmission, therefore, may depend on either dominant or recessive genes, and it has been suggested that there is a one-to-one relationship between the responsible gene and the responsible enzyme-absence, probably diaphorase I (Taggart 1950).

As in this case, most patients are thought at first to be suffering from congenital heart-disease, and the case reported by Gasul et al. (1952) simulated tricuspid atresia. But the absence of distress, the normal heart size, and the peculiar lavender-blue cyanosis should suggest the possibility of methæmoglobinæmia. In older children the absence of finger clubbing, near-normal growth, and adequate exercise tolerance, help to exclude cyanotic heart-disease.

To identify the pigment, whole blood should be diluted 10–100 times with water and examined spectroscopically. The dark band of methæmoglobin is seen at 630 millimicrons and disappears on adding 2–3 drops of 5% potassium cyanide, differentiating it from the sulphæmoglobin band at 618 millimicrons which remains fixed.

Methæmoglobinæmia causes a compensatory polycythæmia and increase in the cardiac output. It is uncertain at what level symptoms appear, but extensive animal experiments have been reviewed by Bodansky (1951), who claims that cardiovascular mechanisms are called into play when the concentration of methæmoglobin exceeds 40%. Clinical symptoms and signs are found to vary with the methæmoglobin level, while dyspnœa and cyanosis usually appear in the 15–20% range.

There is some difference in the findings as to whether or not the oxygen-dissociation curve is altered in congenital methæmoglobinæmia. A shift to the left was first observed by Douglas et al. (1912) and confirmed by Barcroft et al. (1926), Hitzenberger (1932), and Gibson

and Harrison (1947). However, Litarczek et al. (1930), Eder et al. (1949), and Waisman et al. (1952) reported no alteration of the oxygen-dissociation curve in single cases of congenital methæmoglobinæmia.

Darling and Roughton (1942), using solutions of hæmoglobin containing added methæmoglobin, showed that the shift occurs both in vivo and in vitro; they also showed that the dissociation curve of the residual oxyhæmoglobin was shifted to the left and its form rendered more hyperbolic. Baikie and Valtis (1954) studied gas transport in two cases, and found a shift to the left in both oxygen-dissociation curves. These were restored to normal by treatment with methylene-blue but not with ascorbic acid.

The reason for these contradictory findings is not certain, but Baikie and Valtis suggest that there may be two or more kinds of congenital methæmoglobinæmia, on the basis of the different oxygen-dissociation curves reported. As an alternative they suggest that it may not be methæmoglobin but some other factor which is responsible for the abnormality of the oxygen-dissociation curve, this being supported by the difference in response to ascorbic acid and methylene-blue.

TREATMENT

The two agents most commonly used are methylene-blue and ascorbic acid. Methylene-blue is generally conceded to be more effective, and can be given either intravenously in doses of 1–10 mg. per kg. body-weight, with the disappearance of cyanosis within 1–2 hours, or by mouth, in which case the cyanosis usually disappears within 24 hours. If no more methylene-blue is given, there is a gradual daily transformation of hæmoglobin into methæmoglobin at the rate of about 3% a day (Eder et al. 1949). The mode of action of methylene-blue is not definitely known, but Kay and MacMahon (1953) suggest that it acts by means of a second enzyme system, in which a related but different coenzyme—diaphorase II—takes part. Diaphorase II can convert methæmoglobin to hæmoglobin if methylene-blue is present.

Ascorbic acid is thought to act directly as a reducing agent, converting iron in the ferric state to the ferrous form present in normal hæmoglobin. Large amounts (300–500 mg. daily) are required and the reduction is often sluggish and incomplete. In no reported case has this drug brought the methæmogoblin level down to normal. The treatment of choice is therefore methylene-blue, but if intolerance to this drug develops it may be necessary to depend on ascorbic acid or to combine the two. Treatment must be given for life, and the drugs cause no ill effects.

EARLY TREATMENT AND MENTAL DEFICIENCY

Only three other cases of congenital methæmoglobinæmia treated in early infancy have been reported. Schwartz and Rector (1940) described an infant aged 2 weeks and Dine (1956) two siblings treated from the 16th and 1st day of life.

Korver (1953) has recorded the successful treatment with methylene-blue of a child aged 2 months; the family history showed that there had been two previous siblings with a similar degree of cyanosis, both of whom had died at the age of 10 weeks, and it seems extremely likely that both these children had congenital methæmoglobinæmia. The mother had a methæmoglobin content of 2%, her brother 2·5%, and her father 11·8%.

In Dine's first case, the motor development was much retarded. The second patient had severe hyperbilirubinæmia, thought to be due to hæmolytic disease, and required three exchange transfusions; but there were no signs of kernicterus, and the author suggests that a long period of hypermethæmoglobinæmia may have been the cause of the mental retardation.

Worster-Drought et al. (1953) described three affected siblings who were all low-grade mental defectives. Treatment did not benefit the mental condition, but some of the tendon reflexes reappeared in the two elder children. Other cases of congenital methæmoglobinæmia associated with oligophrenia have been noted by van den Berg (1905), Hitzenberger (1932), Kay and MacMahon (1953), Williamson and Black (1954), and Gibson (1956).

The evidence of Korver and Dine makes it tempting to regard the mental deficiency as the result of the methæmoglobinæmia. But other workers think it more probable that both the mental defect and the methæmoglobinæmia are inherited separately, possibly as recessive characters from heterozygous parents (Penrose 1950), in view of the fact that cases have been recorded of patients with a normal intelligence despite a high level of methæmoglobin. For example, Eder et al. (1949) described a man of 23 years with 45% methæmoglobin and a normal intellect. Worster-Drought et al. (1953) have likened the association to that pertaining in Huntington's chorea, where dementia and chorea are transmitted by separate genes.

The significance of the retardation of development in our case must await the future for its true assessment. If it is due to the methæmoglobinæmia then its occurrence, despite early treatment, is disappointing. Whether or not mental deficiency can be prevented by early treatment, as with other inborn errors of metabolism such as phenylketonuria and galactosæmia, must remain in doubt until a larger number of cases treated from birth have been followed.

Summary

In a case of congenital methæmoglobinæmia of unusual severity, treatment with methylene-blue led to reduction in the methæmoglobin content. At the age of 6 months, the infant's development was moderately retarded.

It is not yet known for certain whether the mental deficiency which often accompanies methæmoglobinæmia is caused by it and hence preventable by treatment.

We wish to thank Dr. N. R. Matheson for assessing the development quotient and Dr. N. Brockman for the blood studies.

ADDENDUM

Since this report was submitted for publication a further case has come into our care.

The patient, a first-born girl (there had been one previous miscarriage) was born on Sept. 1, 1957, after a normal pregnancy and weighed 8 lb. 5 oz. The parents, who are of low intelligence, are unrelated. No methæmoglobin was found in their blood and there is no family history suggesting methæmoglobinæmia.

The infant was noted to be blue at birth but cried well and was not distressed. The heart and lungs were clinically normal. The cyanosis persisted and at the age of 17 days she was admitted to this hospital. The total blood-pigments were equal to 18·6 g. hæmoglobin per 100 ml., of which 15% (2·8 g.) was methæmoglobin.

Treatment with oral methylene-blue 30 mg. b.d. was started at the age of 20 days, causing clinical cyanosis to disappear in 3 hours. Within 24 hours the level of methæmoglobin in the blood had fallen to less than 3%, and in a week no methæmoglobin was detectable.

The parents moved to London and the baby was referred to Dr. Wilfrid Sheldon, at the Hospital for Sick Children, Great Ormond Street, who has kindly permitted us to include his findings. In the 4-day interval the mother had stopped treatment because she objected to the blue discoloration of the napkins, and methæmoglobin had regenerated to a level of 27% while the infant's total hæmoglobin was equal to only 10·3 g. per 100 ml. A transfusion of 240 ml. of whole blood brought the total hæmoglobin up to 19·4 g., of which 14% (1·4 g.) was methæmoglobin. Over the next fortnight this percentage remained nearly constant, showing that the transfused cells had maintained their oxygen-carrying capacity. Ascorbic acid 100 mg. daily was now started, and 4 days later the methæmoglobin level had fallen to less than 1%.

The development quotient on the Ruth Griffiths scale at the age of a month was 124, made up of the following subscales:

locomotor 119, personal social 119, hearing and speech 119, eye and hand 132, performance 132. This shows no evidence of mental retardation.

This case was unusual in that ascorbic acid was as effective as methylene-blue. Ascorbic acid is much more pleasant for the parents.

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Reviews of Books

The Diagnosis and Treatment of Infections

D. GERAINT JAMES, M.D., M.R.C.P., clinical assistant, The Middlesex Hospital, London. Oxford : Blackwell Scientific Publications. 1957. Pp. 234. 30*s*.

IN a welcome attempt to ease the task of the student and doctor struggling to keep a hold on the diverging branches of modern medicine, Dr. Geraint James has written concisely and dogmatically.

His book is in three sections. The first gives an excellent account of the chemotherapeutic agents (synthetic drugs and antibiotics) which have become available in the past twenty years, and it is a valuable short guide to the newer antibiotics. The second section describes microorganisms causing human disease. No attempt to summarise all human bacteriology, parasitology, virology, and a few other subjects in 90 pages can wholly succeed ; but at the very least students will find here the means to answer examination questions. The third section deals with infections by systems. Again, the subject is too vast for the few pages available. The sections on diagnosis may indicate to the student how a diagnosis has been made by others, but they will be less helpful if he has to make it himself. But the paragraphs on treatment are good, and there are two additional chapters which give shrewd practical advice about the handling of pyrexias of unknown origin and about the use of corticosteroids in the management of infections.

On points of detail, no mention is made of lucanthone in the treatment of schistosomiasis or of dapsone for leprosy.

The book's clarity conveys practical instructions simply and intelligibly, and its useful tables summarise much valuable information. For students and others who are wanting a clear guide to the use of the newer antibiotics, Dr. James' book comes at a fortunate moment.

Fat Consumption and Coronary Disease

Surgeon Captain T. L. CLEAVE, M.R.C.P., R.N. Bristol : John Wright. 1957. Pp. 40. 5*s*. 6*d*.

THIS review of the epidemiology of coronary-artery disease may appeal to many readers, for it is thoughtful, modest (there are only 35 judiciously chosen references), and well written. The conclusion reached is that coronary-artery disease is causally associated with the increased consumption of unnatural fats. No attempt is made to identify the chemical components of such fats that may be responsible for the disease. It is postulated, however, that in the course of evolution the appetite has become well adapted to select the quantity and quality of the food needed from a choice of *natural substances*. In the past 150 years industrialisation has introduced many new foods to which the appetite may be not adapted. Captain Cleave advocates the use of natural foods, eaten as the individual desires. His detailed dietary recommendations are a practical compromise between " back to nature " and the necessities of an industrial society. Amidst the profusion of detailed and technical writings on this subject, his book will come refreshingly as a new and practical approach, based on the evidence so far accumulated.

A Primer of Pædiatrics

ELCHON HINDEN, M.D., M.R.C.P., pædiatrician, Whipps Cross Hospital, London. London : Macdonald. 1957. Pp. 356. 25*s*.

CONTEMPORARY pædiatric textbooks often devote what may seem to the student to be too little space to the common conditions he sees in the wards and outpatients and may later see in the home and surgery. Dr. Hinden has taken a new line, cast convention aside, and written a dynamic book based on the child as a developing person whose ailments and disabilities must be viewed against the total biological background. To a large extent he has succeeded in setting out the " new look " in pædiatrics in a palatable and practical way. But no one pædiatrician can have a grasp of genetics, physiology, psychology and education thorough enough to write with authority on childhood in all its aspects. This difficulty could to some extent be offset by including the major references or a short bibliography.

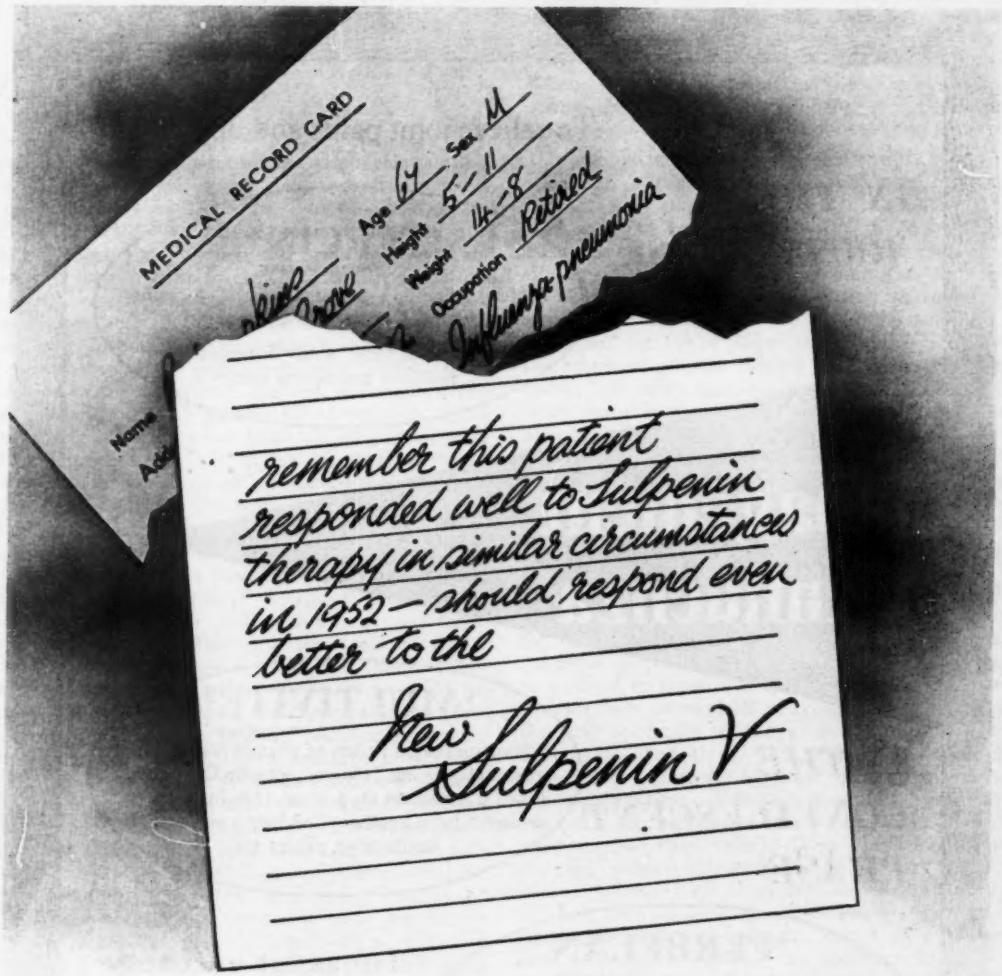
Childhood and its troubles are here treated in chronological order from conception to puberty. So skilfully is this done that the inevitable repetitions are not irksome ; but the lack of an index makes the book of little value as a work of reference. The absence of illustrations is compensated for by the vividness of the text. In all, a notable book which has almost brought off a tremendous undertaking.

Side Effects of Drugs

Untoward effects of drugs as reported in the medical literature of the world during the period 1955–1956. Compiled by L. MEYLER, M.D. Amsterdam : Excerpta Medica Foundation. Edinburgh and London : E. & S. Livingstone. 1957. Pp. 117. 30*s*.

HARDLY a drug in common use (and not many rarer ones) escapes Dr. Meyler's strictures. He has culled from the world's journals a formidable list of examples of adverse effects of drugs, blood and blood-substitutes, and radiographic contrast media. The style is synoptic ; references, innocent of authors' names, are provided. The picture of near-total gloom (the only glimmer is the occasional mention of effective antidotes) should make the reader more cautious in his prescribing—if he ever prescribes anything again.

How to Use a Medical Library (3rd ed. London : Heinemann Medical Books. 1957. Pp. 53. 7*s*. 6*d*.).—A list of the principal medical abstracting journals of the world, arranged according to subjects, helps to swell this new edition of Mr. L. T. Morton's useful little book, whose title is self-explanatory.


MEDICAL RECORD CARD
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Occupation Retired
Influenza pneumonia
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THE LANCET

LONDON: SATURDAY, DECEMBER 7, 1957

A New Syndrome

THE association between some pancreatic islet-cell adenomas and severe, progressive, and often atypical peptic ulceration was recognised by ZOLLINGER and ELLISON in 1955 [1]—a finding that called to mind earlier experiments [2 3] which had prompted POTH and FROM [4] to suggest that internal pancreatic secretions may play a part in the ætiology of peptic ulcer. At least 26 instances of this association have now been described.[5–20] ZOLLINGER suggested that the syndrome can be most usefully considered as a clinical triad, consisting of the pancreatic islet-cell adenoma, severe peptic ulceration, and gastric hypersecretion. This recalls WHIPPLE's classical triad of insulin-secreting tumours; and insulin was, in fact, the first substance to come under scrutiny as a possible link between the syndrome's chief components. Hyperglycæmia is known to stimulate gastric secretion; and (not unnaturally, perhaps, for so common a condition) peptic ulcers have been noted in some patients with insulin-secreting adenomas.[21 22] But it soon became apparent that in the Zollinger-Ellison syndrome hyperglycæmia was neither prominent nor constant; nor did the adenoma-cells contain the characteristic beta-cell granules. It is reasonable to assume that the few patients (about a fifth of the cases so far recorded) who have hyperglycæmic episodes harbour an insulin-secreting tumour as well as a non-insulin-secreting one, or that their tumour is of the mixed-cell variety. Insulin is not, of course, the only hormone secreted by the pancreatic islets: glucagon has been traced to the islet alpha-cells.[23–25] ZOLLINGER and ELLISON found no evidence of glucagon hypersecretion in their patients [19]; but the presence of alpha-cell granules in one of the tumours described by Dr. PRIEST and Dr. ALEXANDER in their article on p. 1145 this week, and mentioned in some earlier recorded cases, cannot be lightly discounted. AVERY JONES [26] has lately hinted that pancreatic neoplasms may play a part in the genesis of peptic ulcers. The obstructive element in the origin of gastric ulcers is again exercising the minds of many surgeons and gastroenterologists [27]; and AVERY JONES raised the question whether the pancreatic adenomas of Zollinger and Ellison might not be acting mechanically as such obstructing agents. Accumulating evidence, however, is far more in favour of a hormonal link.

It would certainly be premature to term these adenomas "non-functioning," merely because we do not yet know what their function is. (Even their relative frequency remains to be established: HOWARD et al.[13] found that they were far less common than insulin-secreting tumours; but PEASE [28] reported no less than 8 in 500 consecutive necropsies.) In almost half of the recorded cases the tumours were multiple: in 3 of those reviewed by ELLISON [19] the whole gland was riddled with islet-cell adenomatosis. The body and tail of the pancreas seem to be more commonly affected than the head, but small adenomatous nodules may also nestle in aberrant pancreatic tissue; this may account for the persistence of symptoms after total pancreatectomy.[20] Most of these tumours sooner or later prove malignant; but they grow slowly and their spread beyond the parent organ is late. In the series reviewed by ELLISON 22 patients underwent surgical treatment—4 for a known pancreatic tumour, and 18 for peptic ulceration. In this latter group the immediate indication for operation was obstruction in 8, massive hæmorrhage in 5, perforation in 3, and failure to respond to medical treatment in 2. The associated pancreatic tumour was recognised only at operation in 9 (at the first operation in 4, and at a subsequent operation in 5)—a reminder that this must be sought in all cases of recurrent, atypical, or particularly severe peptic ulceration. A further 9 patients, in whom the tumour remained unrecognised until necropsy, underwent no less than twenty-three operations, with an average postoperative survival of less than two years. Of the 3 who had only one operation, 2 died of their original ulcer complication (perforation with peritonitis and hæmorrhage), and 1 of a perforated late anastomotic ulcer. In another 3, who were operated on twice, a perforated gastrocesophageal ulcer, a marginal ulcer, and a jejunal ulcer proved fatal within a few weeks of the second operation. Of the remaining 3, 1 was operated on three times and bled to death from a stomal ulcer; 1 had five operations and succumbed to a jejunocolic fistula; and the last did not survive the effects of massive hæmorrhage that had preceded her sixth operation. There were, all told, 3 œsophageal, 1 gastric, 11 marginal, 5 duodenal, and 6 jejunal ulcers in this group, despite the fact that most of the patients had undergone subtotal gastric resection and vagotomy at an early stage of their illness. In these cases there was a massive and sustained outpouring of gastric juice. In some the twelve-hour overnight volume exceeded 2 litres (100 mEq. of free hydrochloric acid), even on a rigorous medical regime and after subtotal gastrectomy and vagotomy.

Removal of the pancreatic tumour without adequate surgical treatment of the ulcer can be no more recommended than the reverse procedure. Assuming that

1. Zollinger, R. M., Ellison, E. H. *Ann. Surg.* 1955, **142**, 709.
2. Dragstedt, L. R., Montgomery, M. L., Ellis, J. C. *Proc. Soc. exp. Biol., N.Y.* 1930, **28**, 109.
3. Poth, E. J., Manhoff, L., Jr., DeLoach, A. W. *Surgery*, 1948, **24**, 62.
4. Poth, E. J., Fromm, S. M. *Gastroenterology*, 1950, **16**, 490.
5. Moyer, C. A., Bernhard, H. R. *Ann. Surg.* 1955, **142**, 725.
6. Underdahl, L. O., Woolner, L. B., Black, B. M. *J. clin. Endocrin.* 1953, **13**, 20.
7. Cunningham, L., Hawe, P., Evans, R. W. *Brit. J. Surg.* 1952, **39**, 319.
8. Dragstedt, L. R., Oberhelman, H. A. *Ann. Surg.* 1955, **142**, 724.
9. Gordon, B. S., Olivetti, R. G. *Gastroenterology*, 1955, **9**, 409.
10. Jenkins, H. P. *Ann. Surg.* 1955, **142**, 724.
11. Wermer, P. *Amer. J. Med.* 1954, **16**, 363.
12. Howard, J., Moss, H., Rhoads, J. *Int. Abstr. Surg.* 1950, **90**, 417.
13. Forty, F., Barrett, G. M. *Brit. J. Surg.* 1952, **40**, 60.
14. Meyer, M. Quoted by Barbosa, J., Dockerty, M. O., Waugh, J. M. *Surg. Gynec. Obstet.* 1946, **82**, 527.
15. Amendola, F. H. *Arch. Surg.* 1949, **59**, 928.
16. Strom, R. *Acta chir. scand.* 1953, **104**, 252.
17. Nerenberg, S. T. *Amer. J. clin. Path.* 1954, **24**, 27.
18. Siler, S., Zinniger, M. M. *Surg. Gynec. Obstet.* 1946, **82**, 301.
19. Ellison, E. H. *Surgery*, 1956, **40**, 147.
20. Case Records of the Massachusetts Gen. Hosp. *New Engl. J. Med.* 1957, **256**, 1153.
21. Whipple, A. O. *Ann. Surg.* 1955, **142**, 724.
22. Janowitz, H. D., Crohn, B. B. *Gastroenterology*, 1951, **17**, 578.
23. Bencosme, S. A. Liepa, E., Lazarus, S. S. *Proc. Soc. exp. Biol., N.Y.* 1955, **90**, 387.
24. Bencosme, S. A., Mariz, S. *Canad. J. Biochem. Physiol.* 1956, **34**, 779.
25. Bencosme, S. A., Frei, J. *Proc. Soc. exp. Biol., N.Y.* 1956, **91**, 589.
26. Avery Jones, F. *Brit. med. J.* 1957, **i**, 719.
27. Johnson, H. D. *Lancet*, Sept. 14, 1957, p. 518.
28. Pease, G. L. Cited by Breidahl, H. D., et al. *Ann. Surg.* 1955, **142**, 698.

the adenoma is in fact solely responsible for the gastric hypersecretion, and indirectly for the ulceration, its removal may be a sound plan theoretically. In practice this takes no account of two dangerous possibilities: first, that budding adenomas have been overlooked (even the tiniest growth can lead to disaster [13]), and, secondly, that distant metastases may already be functioning at the time of the operation.[5] Despite the uniformly stormy postoperative course and the high mortality, ELLISON's review of the available case-material leaves no doubt that a combined procedure for tumour and ulcer offers patients their best, indeed their only, chance. Of 11 patients treated in this way, 3 died within a few weeks of the operation, but in each an overlooked adenoma was found in the pancreatic remnant at necropsy; 3 more succumbed to their ulcer with an average postoperative survival of six years. ZOLLINGER now recommends that in all patients in whom a pancreatic tumour is recognised its removal should be supplemented by total gastrectomy; indeed, he is said to favour total gastrectomy combined with resection of the body and tail of pancreas "in all patients who fit the [the syndrome] clinically . . . but in whom no tumour can be found at operation." [20] When distant metastases are noted at laparotomy, it is probably still wise to remove the primary neoplasm; even a vigorously secreting carcinoma may have inactive or sluggish secondaries.[19]

The relevance of this syndrome to uncomplicated peptic ulcer has yet to be assessed. Meanwhile multiple adenomas, affecting several endocrine glands in one patient, are noted with growing frequency.[29] Among 24 cases of the Zollinger-Ellison syndrome there was 1 with a basophilic adenoma of the pituitary; 1 with an eosinophilic adenoma, a chief-cell adenoma of the parathyroid, and associated acromegaly; 1 with an adrenal cortical adenoma; 2 with multiple adenomas of the pituitary, parathyroid, and adrenal cortex; and several with beta-cell tumours of the pancreatic islets.[19] Peptic ulcers are extremely common; and nothing would be easier than to lose a sense of proportion in evaluating any one of the growing number of deviously related ætiological factors. But even if awareness of the new syndrome brings us no closer to solving the ulcer mystery, it has already helped us to define more clearly the extent of our ignorance.

Transfusion of Citrated Blood

THE use of blood-transfusion has extended enormously in the past twenty years from the occasional pint of blood withdrawn from the donor, often by the surgeon himself, only when it was needed, to the present wholesale and sometimes routine infusion of large volumes made available, with almost too much ease, by the blood-transfusion services. The rapid transfusion of very large amounts of stored citrated blood, far in excess of the litre an hour which ADAMS et al.[30] concluded was probably the safe upper limit of dosage, has been accomplished with apparently few ill effects. There are, however, many isolated accounts of complications of blood-transfusion which, when gathered together, must cause some misgiving to those who habitually transfuse blood even on a small scale.

In three years' experimental work and in clinical observation on patients, Dr. FIRT and Dr. HEJHAL, whose report we publish this week, have distinguished three types of failure of response to treatment of severe blood-loss by transfusion. The first, and in their experience the largest, group was that in which the rate and volume of blood transfused were insufficient. It seems surprising that this group should be relatively so large, for there has been in recent years almost too much emphasis on the free use of blood-transfusion. PRENTICE et al.[31] and others in the United States and FLEAR and CLARKE [32] in this country have recommended that more and yet more blood should be used, but many may feel that perhaps too much is already being used in too many patients. Too little blood too late is now much more likely to be the unfortunate result of circumstances beyond the clinician's control than of an attitude of mind by which the need for adequate replacement is not recognised or is ignored. For example, the treatment of bleeding from gastric or duodenal ulcers is complicated by the higher incidence of associated disease in older patients, among whom most of the deaths occur; and the results of treatment of bleeding œsophageal varices are often unsatisfactory, not because too little blood is used, but rather because, when bleeding persists, the source is not easily dealt with directly.

Of the two other types of complication noted by FIRT and HEJHAL, one was deterioration in general condition with a rising venous pressure, and the other was cardiac failure. The fear of such complications naturally induced caution, with a general reduction in both the quantity of blood transfused and the rate of transfusion. It seemed as if there was some sensitivity to blood in these patients which limited their capacity as recipients to an amount far below the amount of blood lost.

In a series of studies on dogs FIRT and HEJHAL found that, after rapid arterial bleeding until the systolic blood-pressure fell to 60 mm. Hg, the transfusion of the shed blood was accompanied by signs of cardiac overloading and heart-failure in all animals when the blood was citrated before infusion, but in none when the blood was heparinised, even when it was replaced very rapidly. They found that the injection of 3·8% sodium-citrate solution into the jugular vein caused a transient fall succeeded by a rise of pressures in the pulmonary and femoral arteries, the pulmonary vein, and the inferior vena cava. This effect of citrate was reduced by the simultaneous intravenous administration of 10% calcium-gluconate solution, and in 4 out of 5 animals was abolished by calcium gluconate combined with 1% procaine solution. When they gave procaine before and procaine and calcium gluconate during the transfusion of citrated blood, venous pressure did not rise as it had when citrated blood alone was injected.

Unlike GURD and GARDNER [33] and HAMPSON et al.,[34] who did not detect any difference between the effects on venous pressure of transfusion of similar volumes at comparable rates, whether these were given into an artery or a vein, FIRT and HEJHAL found a larger rise of venous pressure when citrated blood was transfused into a vein; and all the animals in the intravenous group

29. Rienhoff, W. F. Jr. *Ann. Surg.* 1955, **142**, 706.
30. Adams, W. E., Thornton, T. F. Jr., Allen, J. G., Gonzales, D. E. *ibid.* 1944, **120**, 656.
31. Prentice, T. C., Olney, J. M., Artz, C. P., Howard, J. M. *Surg. Gynec. Obstet.* 1954, **99**, 542.
32. Flear, C. T. G., Clarke, R. *Clin. Sci.* 1955, **14**, 575.
33. Gurd, F. N., Gardner, C. M. *Amer. J. Surg.* 1955, **89**, 725.
34. Hampson, L. G., Scott, H. J., Gurd, F. N. *Ann. Surg.* 1954, **140**, 56.

died, while all those in the intra-arterial group survived. FIRT and HEJHAL found that the citrate content of blood withdrawn through a catheter from the right ventricle was always higher during intravenous than during intra-arterial transfusion, and they suggest that this was due to removal of citrate from the blood as it passed through the peripheral capillaries. Finally when sodium-citrate solution was infused into another vein during the transfusion of heparinised blood, venous pressure rose as much as it did with the intravenous infusion of citrated blood. There seems some justification for their conclusion that increase of the venous pressure and cardiac failure during transfusion are due at least partly to the sodium-citrate content of the blood, and not solely to the rate of transfusion or the quantity of blood administered. A somewhat similar functional disturbance was noticed by NAKASONE [35] in dogs during experiments with an artificial kidney in which citrated blood was circulated rapidly; he found that disturbances in the electrocardiographic (E.C.G.) tracing were closely related to the dose of citrate. These effects could be avoided by transfusing blood which had been rendered hypocalcæmic by passage over a cationic exchange resin [36]; yet a nearly normal serum-calcium level was maintained in the recipient dogs, presumably because of rapid mobilisation of calcium from the bones. Tetany has been reported during exchange transfusions in newborn infants [37-40] and after the transfusion of citrated plasma in infants [41]; and this can be sometimes abolished by administering a solution of calcium gluconate. With serial electrocardiography FURMAN et al.[39] showed that there was a progressive increase in the QT interval, an increased ST segment, and a decreased amplitude of the T wave during the injection of citrated blood, which could be corrected by the injection of calcium gluconate into another vein. They found that the serum-calcium level was not necessarily related to the functional disturbances caused by changes in the serum-ionised-calcium, since the chemical method of estimating serum-total-calcium which they used measures both the ionised fraction and the calcium bound to protein and citrate. GUSTAFSON [40] also recommended the use of electrocardiography during exchange transfusion, as it gave the earliest indication of citrate intoxication. This was the conclusion also of HUBBARD et al.,[42] who observed severe citrate intoxication during rapid transfusion after bleeding in the course of infundibular resection in a patient with the tetrad of Fallot. They believed that a fall in ionised calcium led to tetany and was associated with prolongation of the QT interval and the ST segment of the E.C.G., indicating prolongation of ventricular systole; the consequent hypotension does not respond to further transfusion and may progress to cardiac arrest. Under anæsthesia muscle tremors or tetany do not develop, and the E.C.G. is then the best indication of citrate intoxication. Citrate intoxication deserves to be remembered as another possible cause of cardiac arrest under anæsthesia during a transfusion.

Citrate is excreted in the urine as well as being metabolised in the muscles and liver, and possibly the use of citrated blood is theoretically unwise in patients with severe disturbance of renal or hepatic function. But the rate of transfusion may be the factor that determines whether citrate intoxication develops. FIRT and HEJHAL transfused some of their dogs at 20–77 ml. per kg. per minute—equivalent in a 70 kg. (11 st.) adult to 1·4–5·39 litres (2–10 pints) per minute, which is far beyond the capacity of any existing transfusion equipment. Even the slower rate of replacement which they used in some experiments—6 ml. per kg. per minute—was three times as fast as the rate (2 ml. per kg. per minute) at which they had bled the dog from the femoral artery. HUBBARD et al.[42] replaced about a third of the blood-volume of their patient in 30 minutes; and GUSTAFSON [40] injected 500–520 ml. of citrated blood into erythroblastic newborn babies in an average time of 75 minutes. Because citrate intoxication developed in these circumstances it should not necessarily be concluded that rapid transfusion will always be dangerous. GURD and GARDNER [33] found in dogs that, after bleeding, sufficiently rapid transfusion of 75% of the shed blood was an important factor in survival, but that when this volume had been injected the rate should be reduced because of the risk of cardiac failure. They pointed out that venous pressure always rises in the initial stage of transfusion but falls as arterial pressure rises. It is the later secondary rise in venous pressure combined with a fall in arterial pressure despite continuing transfusion that indicates the onset of cardiac failure; and this can be avoided by reducing the rate of transfusion. FIRT and HEJHAL found that in some of their patients the venous pressure rose when only half the estimated blood-loss had been replaced by transfusion, but this difference may have been due to errors in estimation of blood-loss. BUNKER et al.[36] did not find any evidence of citrate intoxication in 33 patients who received multiple transfusions at less than 500 ml. every half-hour; 19 patients received more than 2000 ml. and 5 more than 3500 ml. of citrated blood, thus confirming the findings of ALLEN et al.[43] The poor tolerance for citrate of patients with advanced liver disease was shown by the higher serum-citrate and lower calculated ionised-calcium levels found in such patients when transfused at a rate of 500 ml. per minute.[36] Even when there was no liver disease the serum-citrate level rose when the rate of transfusion was doubled, and at such rates this level was related more closely to the total dose of citrate than to the rate of administration. In 28 of their patients a high serum-citrate level was associated with a calculated serum-ionised-calcium level below 0·8 milli-mol. per litre, and in 5 of these it fell to 0·55 milli-mol. per litre; and they recalled that the isolated frog's heart preparation of MCLEAN and HASTINGS [44] stopped beating at an ionised-calcium level of 0·5 ml. per litre. 17 of these patients had liver disease, and in 5 the aorta was resected and grafted and the volumes of blood transfused ranged from 350 ml. to 15 litres. Although they administered calcium chloride whenever they suspected that the

35. Nakasone, N., Watkins, E. Jr., Janeway, C. A., Gross, R. E. *J. Lab. clin. Med.* 1954, **43**, 184.
36. Bunker, J. P., Stetson, J. B., Coe, R. C., Grillo, H. C., Murphy, A. J. *J. Amer. med. Ass.* 1955, **15**, 1361. See *Lancet*, 1955, ii, 813.
37. Wallerstein, H. *Amer. J. Dis. Child.* 1947, **73**, 19.
38. Wexler, I. B., Pincus, J. B., Natelson, S., Lugovoy, J. K. *J. clin. Invest.* 1949, **28**, 474.
39. Furman, R. A., Hellerstein, H. K., Startzman, V. V. *J. Pediat.* 1951, **38**, 45.
40. Gustafson, J. E. *ibid.* 1951, **39**, 593.
41. Ames, R., Sylim, I., Rapoport, S. *Pediatrics*, 1950, **6**, 361.
42. Hubbard, T. F., Neis, D. D., Barmore, J. L. *J. Amer. med. Ass.* 1956, **162**, 1534.
43. Allen, J. G., Clark, D. E., Thornton, T. F., Adams, W. E. *Surgery*, 1944, **15**, 824.
44. McLean, F. C., Hastings, A. B. *J. biol. Chem.* 1934, **107**, 337, 351; *ibid.* 1935, **108**, 285.

ionised-calcium fraction might be depressed the results were not consistently good, and they found that estimation of the dose was difficult and overdosage dangerous.

In most circumstances, as FIRT and HEJHAL suggest, the risk of citrate poisoning is small; but it should be clearly borne in mind whenever a large volume of citrated blood is transfused rapidly, and especially when there is a disappointing response to apparently adequate replacement. It is particularly likely to develop during massive transfusions in patients with severe liver disease or interference with normal hepatic circulation, and during operations on the heart and great vessels, especially when the whole body is cooled. Apart from packed red cells, most of the alternatives to citrated whole blood which have been suggested, such as red cells suspended in dextran or gelatin, or decalcified blood, are objectionable—usually because of the amount of manipulation involved and the great risk of infection. Awareness of the risk of citrate poisoning should go far to reduce deaths from this cause, but in addition there should be a wider recognition of the risks of blood-transfusion: the sooner bleeding is stopped, the smaller is the amount of blood that has to be transfused.

Annotations

STAPHYLOCOCCI OUTSIDE HOSPITALS

IN hospitals penicillin is still often used, and there is a fair prospect of its doing good if the infecting organism is penicillin-sensitive—for example, meningococcus, gonococcus, pneumococcus, or hæmolytic streptococcus. A staphylococcus infection acquired outside hospital is likely to be due to a penicillin-sensitive organism, whereas a staphylococcus infection acquired inside hospital is much more likely to be due to a penicillinase-producing, penicillin-resistant organism. This is because penicillin is too often given in hospital as a placebo, as a treatment for undiagnosed infections, as a substitute for a reliable technique of asepsis, and in the treatment of minor infections which would quickly resolve without its use. Because penicillin is so widely administered within their walls, hospitals are often visited by what has been called a staphylococcus plague.[1] The dangers that are thus forced on patients in hospital have been repeatedly stressed in our columns. The simple explanation of the staphylococcus plague is that, in hospitals where much penicillin is given, penicillin-resistant strains of staphylococci replace the sensitive ones. It now seems necessary to note the danger that may arise from the spread of penicillin-resistant staphylococci from hospital to the general community. The danger is real. About 14–18% of healthy adults now carry penicillin-resistant staphylococci in their noses,[2] compared with some 6% in 1954.[3] Recent investigations emphasise the important part that may be played by maternity hospitals in the spread of this kind of infection.

Hutchison and Bowman [4] examined events in a maternity hospital for thirteen weeks. From 3542 swabs from infants, mothers, hospital staff, and dust they isolated 2260 strains of *Staphylococcus aureus*, which were examined for antibiotic sensitivity and by phage-typing. Staphylococci isolated from mothers on admission to hospital were 86% penicillin-sensitive and 14% penicillin-resistant. Staphylococci from mothers discharged from the lying-in wards were 40% penicillin-sensitive and 60% penicillin-resistant—a notable change. Women discharged from the antenatal ward showed no such change. Thus there is a real risk of spread of penicillin-resistant staphylococci from hospitals to the general population. But the risk may not be quite so great as it seems at first. Hutchison and Bowman continued investigations on 28 women who were discharged from hospital carrying easily identifiable strains of *Staph. aureus*. Six weeks later, of 18 examined 7 were carrying hospital strains, 5 were no longer carriers, and 6 carried non-hospital types. Six months later 2 out of 10 women were carrying the hospital type but their infants were not; one infant carried a hospital type no longer found in its mother's nose. There was some evidence that resistant hospital strains might revert to sensitivity in the home environment.

The same problem was investigated by Hurst.[5] She found that 99% of 106 babies born in hospitals harboured coagulase-positive *Staph. aureus* by the time they left the hospital nursery. When the strains of 34 of these infants were examined in detail, it was found that 33 (97%) of the babies carried at least one penicillin-resistant strain. At least half of the infants who were followed continued to carry hospital staphylococci at the end of their first year of life, the organisms being found for a longer period in the throats than in the noses. The inference is that the staphylococci acquired at birth may prevent new strains of staphylococci from becoming established later. This may explain why hospital-born babies tend to retain their antibiotic-resistant hospital staphylococci longer than their mothers. Since the staphylococci are carried in the throat, and since babies' saliva is widely distributed, babies born in hospital are a potentially important source of antibiotic-resistant staphylococci distributed to the general public. Of 36 babies born at home 72% acquired staphylococci in their noses and throats within the first two weeks of life, but only 18% acquired penicillin-resistant strains. There was no evidence that the penicillin-sensitive strains acquired at home were carried for shorter periods than the penicillin-resistant hospital strains. Babies that did not acquire *Staph. aureus* in the first fortnight either acquired it in the throat alone or were non-carriers. Apparently babies who do not become carriers of staphylococci in the first two months of life are unlikely to become carriers later.

Meanwhile, Dr. Gould and Dr. Cruikshank, whose article appears in a later part of this issue, have examined the epidemiology of staphylococcal infection in a non-industrial urban general practice. Among 300 patients without staphylococcal lesions, 33% were nasal carriers of staphylococci, and 84% of the carried strains were penicillin-sensitive. 5% of the patients in the practice had one or more superficial staphylococcal infections each year. 95% of the lesions responded to simple local treatment and the remainder to systemic penicillin therapy. The best way of preventing recurrence of infection, which is so common and so distressing, appears to be to administer an antibacterial cream to the nose for one week out of four. To reduce the risk of sensitising patients and producing antibiotic-resistant staphylococci, Gould and Cruikshank used a cream containing chlorhexidine ('Hibitane') (0·5%) with neomycin sulphate (0·5%) or bacitracin (2000 units per g.). This proved to be effective and non-irritant in the dosage recommended.

PROFILE BY PULHESTIB

PULHEEMS profiles [6] are familiar to most doctors who have served in the Forces. Holt,[7] seeking to classify the functional disabilities of handicapped children, suggests a modification of PULHEEMS called PULHESTIB. Each

1. *Lancet*, 1957, i, 723.
2. Fusillo, M. H., Roerig, R. N., Ernst, K. F. *Antibiot. Chemother.* 1954, **4**, 1202.
3. Rountree, P. M., Rheuben, J. *Med. J. Aust.* 1956, i, 399.
4. Hutchison, J. G. P., Bowman, W. D. *Acta pædiat., Stockh.* 1957, **46**, 125.
5. Hurst, V. *J. Hyg., Camb.* 1957, **55**, 299, 313.
6. Fletcher, R. T. *Brit. med. J.* 1949, i, 83.
7. Holt, K. S. *Arch. Dis. Childh.* 1957, **32**, 226.

letter stands for a section of the profile: P for general physique, U for upper limbs, L for the lower limbs and locomotion, H for hearing, E for eyes, S for speech, "T for toilet," I for intelligence, and B for behaviour. Abilities under each section are rated on a four-point scale, 1 meaning full ability and 4 meaning no ability. Children with one handicap often have others; thus a spastic child may also be epileptic and mentally retarded and have a behaviour disorder. Medical and social workers trained to help with one of these handicaps may neglect the others. A classification by lesions or by physical signs is often deceptive. Thus the group "deaf" includes some children whose intellectual defect makes training in a school for the deaf quite impossible. A classification based on the functional abilities of many organs helps to keep the whole child in view.

Profiles by PULHESTIB are welcome, but must we have such an ugly name? Dr. Holt should find a more euphonious anagram. PHUTILEBS trips well but sounds discouraging. But LUPHIBEST is sonorous and indeed might pass as a proper name.

CAVAL INFUSION IN THE TREATMENT OF ACUTE RENAL FAILURE

THE principles of conservative treatment of anuria [1 2] are widely agreed in this country. When the illness is mild the patient can be fed orally on lactose and water [3]—a regimen that can be tolerated for two weeks or even longer. In more severe cases it may be necessary to resort to intragastric tube-feeding [1], though the originators of the method use it much less often now [4] and prefer caval infusion after catheterisation [5–8].

Chambers and Smith [9] have lately described their experience of this technique. In one of the Glasgow hospital sectors, which has more than 3000 beds, these workers have since 1950 encountered 29 patients with acute renal failure, of whom 8 needed caval catheterisation. They have also applied this technique to 2 cases in which severe postoperative illness and intestinal obstruction necessitated long-continued intravenous therapy. They use a nylon cardiac catheter (no. 9F) inserted into the right femoral vein via a cut-down on the great saphenous vein at its upper end. The catheter is so placed that its tip lies just below the entry of the inferior vena cava into the right atrium, and the hypertonic infusion is diluted by the largest possible blood-flow. Chambers and Smith emphasise that flow through the catheter must be continuous, and they place a Y-piece in the rubber-tubing so that a second reservoir of fluid is available when the first is being replenished. Heparin (1000 units per 500 ml.) is added to the infusion. Of 10 patients so treated for periods of four to twenty-five days, 6 survived and 4 died. It is thought that the 6 surviving patients owed their lives to caval therapy, and that such therapy did not contribute in any way to the deaths (though necropsy was carried out in only 2 of the 4 fatal cases). Death was delayed for remarkably long periods in inevitably fatal cases. There was no wound sepsis at the site of catheter insertion, no pulmonary embolism, and no trouble in withdrawing the catheter at the cessation of treatment. There was no need of an artificial kidney in this series.

Caval catheterisation has not been universally accepted, and Taylor [10], in cases of acute renal failure following head injury and surgical operation, has largely abandoned it in favour of infusing 5–20% glucose solution through a polyethylene catheter inserted several inches into a peripheral vein. Publication of further series of cases of acute renal failure treated by caval catheterisation would help to define its real value in this condition.

1. Bull, G. M., Joekes, A. M., Lowe, K. G. *Lancet*, 1949, ii, 229.
2. Evans, B. M., Hughes-Jones, N. C., Milne, M. D., Yellowlees, H. *ibid.* 1953, ii, 791.
3. Oard, H. C., Walker, G. I. Jr. *Amer. J. Med.* 1955, **18**, 199.
4. Bull, G. M., Joekes, A. M., Lowe, K. G. *Lancet*, 1955, ii, 1152.
5. De Keyser, R., Van Eeckhoutte, P., Kop, P. S. M., Kolff, W. J. *Ned. Tijdschr. Geneesk.* 1949, **93**, 2386.
6. Russell, C. S., Dewhurst, C. J., Brace, J. C. *Lancet*, 1954, i, 902.
7. Shaw, G., Mair, J. *ibid.* p. 1031.
8. Chalmers, J. A., Fawns, H. T. *ibid.* 1955, i, 79.
9. Chambers, J. W., Smith, G. *Brit. J. Surg.* 1957, **45**, 160.
10. Taylor, W. H. *Lancet*, Oct. 12, 1957, p. 703.

FIVE YEARS OLD

FROM its foundation the College of General Practitioners, which was five years old on Nov. 19, has set much store by its faculties and peripheral councils; and with new councils in Australia and New Zealand, and an active faculty in Kenya, its influence is spreading far afield. There are now thirty-five faculties in all; twenty-two of these are in the United Kingdom and the remainder overseas. The faculties give elasticity to the College, for they enable its activities to be adjusted to local conditions, particularly in undergraduate education, postgraduate education, and research. (In Canada the College of General Practice is firmly established, and shares the same ideals.) But the expansion of the College has not been wholly at the periphery; increasing demands on the centre have made it necessary to move the College office to more spacious accommodation.

The fifth annual report shows that there has been further extension of the work of the three main committees of council. The undergraduate who qualifies without having had personal experience of good general practice will soon be the exception, and educational activities in every faculty ensure that members and associates can honour their obligation to undertake postgraduate study. Here again much of the success achieved has been due to the efficient working of the faculty system. The research committee has had the support of a research register of increasing size and value. College investigations, both large and small, are in progress, some in collaboration with other research bodies. A College records unit is to be established to undertake the continued study of morbidity in general practice. This work, together with the coordination of the research of the councils and faculties, throws a heavy strain on the financial and personal resources of the College, and the limit of voluntary endeavour has almost been reached.

In the spiritual sense, the College makes steady progress. It has examined itself and studied its own criteria for entrance and continued membership. No doubt these will become stricter. It remains true to the academic standard which it has set for itself.

STERILISING SYRINGES BY RADIATION

THE demand for sterile syringes and needles is becoming so great that more and more hospitals are considering the advisability of starting a central syringe service. How widely the demand for syringes varies between different hospitals has been shown by Murphy,[1] who chose an area of East Anglia containing hospitals of all types and took a census of injections for a week. At one end of the scale a general (acute) hospital with only 16·1% of the total beds accounted for 56·7% of all injections, while at the other end a mental hospital with 44·9% of the total beds accounted for only 9·0% of the injections. Opinions have differed on the best methods of sterilising syringes and needles; and some hospitals still use the autoclave for this purpose, despite the Medical Research Council's insistence [2] that hot-air sterilisation is best. Grave theoretical objections to autoclaves for sterilising assembled syringes have been raised by Darmady and Hughes,[3] who point out that it is difficult for steam to penetrate between the plunger and barrel of an assembled syringe,

1. Murphy, E. C. *Mon. Bull. Min. Hlth Lab. Serv.* 1957, **16**, 212.
2. The Sterilisation, Use and Care of Syringes. Medical Research Council War Memorandum no. 15. H.M. Stationery Office, 1945.
3. Darmady, E. M., Hughes, K. E. *Lancet*, 1955, i, 513.

and consequently dry heat only is applied at too low a temperature to kill spores. Unfortunately, hot-air ovens are not always efficient [4]; unless such an oven is fitted with a fan to circulate the hot air, it is apt to contain pockets of cool air which prevent proper sterilisation.

Darmady et al.[5] have now produced a valuable report on a radiation method of sterilising syringes. These are loaded in a single layer on trays and conveyed on an endless belt through a chamber containing electric "infra-red" projectors. With the help of Brigadier J. D. Welch, of the Nuffield Provincial Hospitals Trust, they have arrived at the rate of 4 inches per minute for the moving belt—a speed that allows suitable time for an orderly to load trays. Darmady and his associates find that a temperature of 180°C for at least 11 minutes ensures sterility; and, so that both large and small syringes shall heat up at the same rate, they have adopted the ingenious idea of putting the large syringes in matt black containers and the small ones in dull aluminium containers. Darmady et al. believe that the ultimate cost of the sterilising apparatus would not be greater than that of hot-air ovens, while the simplicity of its operation would allow less skilled operators to be employed, with consequent saving of money.

It must surely be obvious that some system ensuring sterility of syringes should be installed in all hospitals; and we hope that this report by Darmady and his associates will be widely studied.

MORTAL SEIZURES

EPILEPTIC seizures are so dramatic a disruption of normal behaviour that they cannot easily be thought harmless; and for centuries these attacks were regarded as a danger to life and to reason. But, gradually, opinion changed. Most infantile convulsions and most of the major seizures of epileptics were found to end spontaneously and to leave no defect behind them. So the belief grew that fits, in themselves, involved no risk; there followed the deduction that active medical treatment to stop the fit was not needed. Both theory and deduction are still, in the main, reliable; but recent work has shown that the general rule has important exceptions.

Status epilepticus was known to be a cause of death in epileptics, and in 1951 Ounsted [6] showed that long seizures in ill children were closely associated with death or permanent cerebral damage. He found that prophylaxis and treatment reduced mortality, and suggested that the fits themselves were a cause of brain-injury. This hypothesis lacked pathological support. It was quite possible that the fits were symptoms, rather than a cause, of brain-injury.

Fowler [7] has now reported neurological studies which suggest that long seizures cause severe neuronal necrosis in young children's brains. Five children, all aged less than 2 years, all free from neurological disorder, developed protracted convulsions with febrile illnesses. When their seizures were over the children had clinical signs of brain-injury; and soon afterwards they died. At necropsy their brains showed grave damage. Neuronal necrosis was found in the cerebral cortex and in the basal ganglia; the midbrain, pons and medulla were spared; the cerebellum was affected in 1 case; the meninges, choroid plexuses, cerebral blood-vessels, and dural sinuses were healthy. No evidence of viral or bacterial invasion was found. Areas affected by neuronal necrosis were scattered rather irregularly throughout the cortex and basal ganglia. Layer III was the most commonly affected, and sometimes this was the only cortical layer containing lesions. Fowler points out that in three cases there were lesions in the temporal lobes which, had the children lived, might have become the source of chronic epileptic attacks. Fowler considers that the lesions were due to "systemic anoxia of convulsive origin, or, less likely, to a specific mechanism acting locally in the brain."

There remains the question why these children should have had such severe convulsions on slight provocation. The answer might have been partly revealed by study of their family histories; for Ounsted [8] has shown a close genetic link between mortal convulsions in infancy and intractable epilepsy in close relatives.

The practical deduction seems quite clear: most fits are harmless, but long fits in young children are dangerous in themselves and call for early treatment.

WARLINGHAM PARK

AN exciting seal was this week set on the achievements of one who has for many years made outstanding contributions to the treatment of mental illness—Dr. T. P. Rees, until last year superintendent of Warlingham Park Hospital. On Tuesday Queen Elizabeth the Queen Mother went to Warlingham Park to open the new patients' social centre. This fine building, erected and furnished through the generosity of the King Edward's Hospital Fund for London at a cost of over £38,000, embodies the idea of the therapeutic community in a mental hospital—an idea which is becoming increasingly powerful in mental-hospital management today and one which Dr. Rees has for long energetically promoted. To persuade the patient to share as fully as possible in the life of the hospital community is now recognised to be a big part of his treatment; and the Warlingham Park social centre is an attractive means of persuasion as well as a generous supplement to existing opportunities for useful occupation and recreation in the hospital.

In conception the centre was pictured like a village, with a square or market place surrounded by shops and places of entertainment; and that is the scene which the architect has attempted to set within the limits he was given.[9] The square has become a tiled "concourse" surmounted by a glazed roof and surrounded by an information bureau, a shop, hairdressing salons, and a café. Radiating from the concourse are wings which contain a library and attractive rooms for reading and writing, music, and cards and other games. Provision has also been made in the centre for holding group discussions, which are already a part of treatment but which have hitherto been conducted in less agreeable surroundings. The present disposition of the rooms is entirely provisional and all may be revised if necessary to meet patients'needs more effectively.

At Tuesday's ceremony the Queen Mother was shown something of the older parts of the hospital by its chairman, Mr. H. Lock Kendell, and she heard about the mental-health work going on outside—for example, the clubs for old and young patients, the day hospital, and the full-time child-guidance clinic—all fruitful ventures which owe much of their success to Dr. Rees. He and another former superintendent, Dr. H. M. Berncastle, were present at the ceremony, and for them and all who have helped them to make Warlingham Park a name of renown, it must have been a heartening occasion; for others, it gave a clear sign of the enthusiasm which sustains the spreading and hopeful policy of expecting the patient to behave as a responsible person and giving him every chance to do so.

4. Darmady, E. M., Brock, R. B. *J. clin. Path.* 1954, **7**, 290.
5. Darmady, E. M., Hughes, K. E., Tuke, W. *ibid.* 1957, **10**, 291.
6. Ounsted, C. *Lancet*, 1951, i, 1245.
7. Fowler, M. *Arch. Dis. Childh.* 1957, **32**, 67.
8. Ounsted, C. *Eugen. Rev.* 1955, **47**, 33.
9. The architect to the South West Metropolitan Regional Hospital Board, Mr. R. F. M. Mellor, F.R.I.B.A., was responsible for the design and the supervision of the erection of the centre; and Mr. S. C. Vincent, B.SC., engineer to the board, was responsible for the heating, mechanical, and electrical engineering services.

Special Articles

STAPHYLOCOCCAL INFECTION IN GENERAL PRACTICE

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STAPHYLOCOCCAL infection is common in general practice. Although no figures of its prevalence have been published, some indication is given by Rountree et al. (1956), who obtained a history of furunculosis during the preceding year in 10·7% of blood-donors. The infections are predominantly superficial, consisting of pustules, boils, carbuncles, styes, conjunctivitis, and infected wounds. Deeper lesions such as osteomyelitis and staphylococcal pneumonia are seldom seen.

These conditions cause much discomfort and considerable inconvenience to patients, but their treatment is generally satisfactory because they respond to local measures or (when severe) to systemic penicillin. However, in many cases infection is liable to recur over months or years, and the prevention of such recurrences is difficult—largely because little is known about the epidemiology of staphylococcal infections among the general population.

More time has been devoted lately to the study of staphylococcal infections in hospital, and their epidemiology has been much clarified. Of outstanding importance as the source of the organism are the nasal carriers, who constitute 40–50% of permanent hospital staffs. Probably the nasal carrier is also important as a source of infection outside hospital as well as inside, because the number of such carriers among the general population is high, though lower than in hospital. Most reports cite a carriage-rate of 20–50%, but it is clear that some people are permanent nasal carriers, whereas others merely harbour the organism in the nose temporarily (Gould and McKillop 1954).

The relationship between staphylococcal infection and the nasal carriage of *Staphylococcus pyogenes* was first appreciated by Dolman (1935). The similarity of strains in the nose and in the lesion of the same patient was shown by Valentine (1936), Hobbs et al. (1947), Valentine and Hall-Smith (1952), Tulloch (1954), and Roodyn (1954). For this reason attempts have been made to control superficial staphylococcal infection by inhibiting the microorganism in the nose (Delafield et al. 1941, Burrows et al. 1945, Hobbs et al. 1947, Valentine and Hall-Smith 1952, Gould and Allan 1954, Tulloch 1954). These attempts have been successful where the nasal organism has been susceptible to the antibacterial agent used, and as long as the nose was not recolonised.

We report here the results of an investigation of the epidemiology of staphylococcal infection in an urban general practice, and the preliminary results of experiments to prevent the recurrence of these infections by suppressing the nasal carriage of *Staph. pyogenes* by locally applied antibacterial agents.

Methods

Clinical

The investigation was made in a non-industrial urban general medical practice. As all the patients were seen by one partner in a two-partner practice, clinical assessment was as uniform as is possible.

Only non-traumatic lesions were investigated, and, except for 2 cases of osteomyelitis, all were superficial staphylococcal infections. Every patient reporting with such a lesion was examined clinically and bacteriologically. Swabs were taken from the anterior nares, from the lesion whether it was open or closed, and from the skin at other sites on the body.

Discharging lesions were treated locally with hot fomentations and Elastoplast dressings, unless the infections were so severe that systemic antibiotic therapy was indicated (12 cases). After a lesion had resolved, each patient was re-examined for nasal carriage of *Staph. pyogenes* and, if positive, given an antibacterial cream for local application to the nares. The preparation of the cream has been detailed elsewhere (Gould 1955). Each patient for treatment was given the cream in a ¼-oz. jar and shown how to remove with a matchstick a small quantity about the size of a grape pip. This was done separately for each nostril, and the cream was applied by inunction, different fingers being used for the two nostrils. This treatment was applied four times daily for ten days, at the end of which the patient attended again, and a post-treatment swab was taken. If this swab did not produce *Staph. pyogenes*, the patient was asked to report at intervals for follow-up examination; but if the swab produced *Staph. pyogenes*, a second course of antibacterial cream was given, the antibacterial agent being changed if the in-vitro sensitivity tests indicated that this was advisable.

Bacteriological

Dry sterile swabs were used throughout. The anterior nares were sampled by rotating the swab six times in each nostril. This was done at the first examination and repeated before treatment. In this way we detected persistent carriers with reasonable certainty. Further nasal swabs were taken after treatment and at suitable intervals thereafter throughout the whole period of examination.

Nose swabs, skin swabs, and lesion swabs were plated on milk-agar medium, and the approximate number of colonies of staphylococci was counted. Individual colonies were subcultured in nutrient broth and later examined for coagulase-production and for sensitivity to antibiotics, antibacterial agents, and bacteriophages.

Results

Nasal Carriage-rate

In the twelve months preceding the investigation, 300 consecutive patients without staphylococcal lesions were

TABLE I—CHARACTERISTICS OF STRAINS OF *Staph. pyogenes* ISOLATED FROM NOSES AND LESIONS

Group	Nasal carriers (%)	No. examined	Carrier strains (%)					
			Penicillin-sensitive	Of bacteriophage group				
				I	II	III	IV	Not typable
All patients examined:								
Patients without lesions	33	300	84	24	37	14	6	10
Patients with lesions	82	221	67	32	32	18	5	13
189 patients with lesions who were followed up:								
Patients with lesions who were followed up in detail	93	189	70	32	32	17	4	15
Patients with recurrent lesions	92	100	68	33	31	16	3	17
Cases where nose and lesion yielded similar organisms	..	140	75	30	38	21	4	4
Cases where lesion alone was positive or lesion strain was unlike nose strain	..	26	72	14	28	51	..	7

TABLE II—SUPPRESSION OF *Staph. pyogenes* IN ANTERIOR NARES AS INDICATED BY RESULTS OF NOSE-SWAB CULTURES

Antibacterial agent	No. of patients treated	Percentage in whom nasal swab was negative for *Staph. pyogenes* weeks after withdrawal of antibiotic			
		2	4	8	20
Penicillin 1 %	64	85	72	62	36
Tetracycline / Streptomycin / Chloramphenicol } 1 % ..	24	78	70	57	33
Hibitane preparations* ..	39	64	41	26	10
Total	127	77	62	50	28

* Hibitane diacetate 0·5 %.
Hibitane diacetate 0·5 % + neomycin 0·5 %.
Hibitane diacetate 0·5 % + bacitracin 2000 units per g.

examined for nasal carriage of *Staph. pyogenes* on three successive occasions. A third of these patients proved to be persistent nasal carriers (table I), because an organism of the same phage-type was isolated from their noses at least twice (Gould and McKillop 1954).

Incidence and Nature of Staphylococcal Lesions

In the two years (January, 1955–December, 1956) under review 221 patients with 461 episodes of staphylococcal infection were examined. It was found that 5% of the persons in this practice had one or more lesions each year. There was no evidence of greater frequency of lesions at any particular season, either in individual cases or in the practice as a whole. No particular group within the community appeared particularly liable to have lesions; but, as the practice is non-industrial, few heavy manual workers were seen, and, for this reason, infected injuries were not included. The home conditions were all good, with no evidence of overcrowding. There were 125 cases in females and 96 in males, a ratio which corresponds to the sex-distribution in the practice. No particular age-group was involved, and lesions were found in infants as well as in those of advanced age.

Of the presenting lesions 149 (67%) were boils or septic spots, 42 (19%) were styes, 4 (2%) were abscesses, 24 (11%) sepsis on hands and feet, and 2 (1%) were osteomyelitis. 63% of the lesions occurred on the head and neck, 17% on the arms and hands, 13% on the trunk, and 7% on the legs.

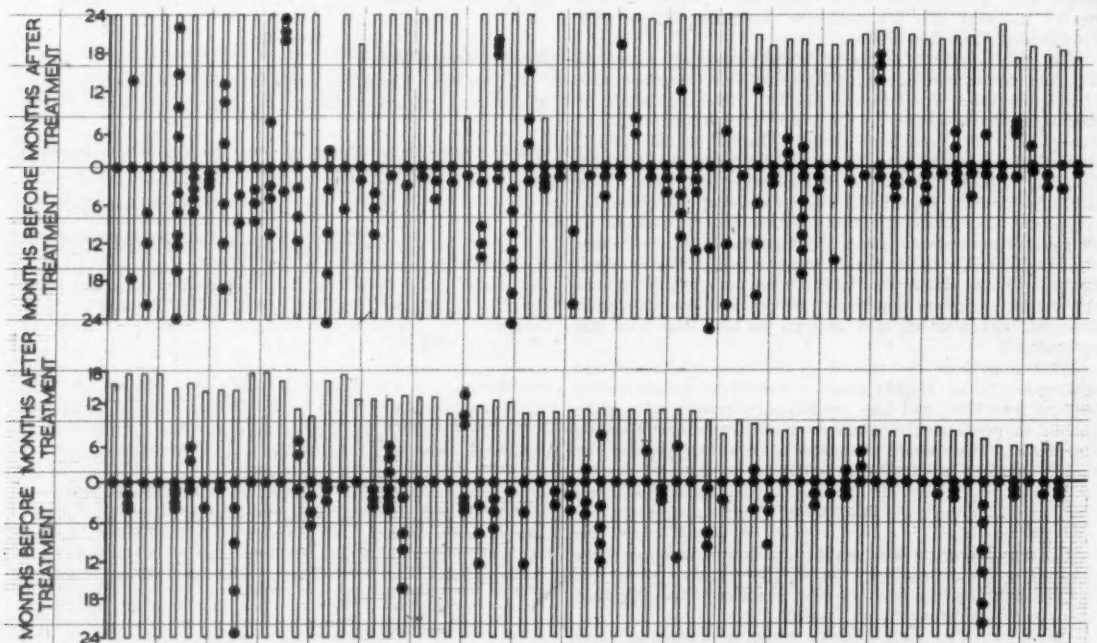
54% of the patients gave a history of other lesions within the previous two years: these were classified as cases of recurrent infection. In the other 46% the presenting lesion was regarded as an initial episode, although only a minority (19%) gave no history of staphylococcal lesions at some time in their lives.

Treatment

Of the 221 patients initially examined only 189 became available for regular follow-up. Of these 189 patients 127 were treated with antibacterial cream. The creams are designated according to their antibacterial contents and were distributed as shown in table II.

The antibacterial cream used was chosen for each patient according to the results of the in-vitro sensitivity tests on the carrier strain. During the first year of the experiment all patients with a penicillin-sensitive carrier strain were given 1% penicillin cream. Those with penicillin-resistant strains in their nares were given an alternative preparation. During the second year half of the patients were given preparations containing 'Hibitane' (bis-*p*-chlorophenyldiguanidohexane). No strains resistant to this substance or to the agents combined with it were observed during the investigation.

The result of treatment of the 127 cases has been measured by comparing the frequency of lesions before and after treatment. The accompanying figure shows that there were considerably fewer lesions in the post-treatment period than in the comparable pre-treatment period. Thus, during the two-year pre-treatment period there was a history of 317 episodes of staphylococcal infection among the 127 patients, whereas in the post-treatment period, which varied from eight to twenty-four months, there were only 56 episodes among the same



Episodes of staphylococcal infection before and after treatment with antibacterial nasal cream.

patients. 96 patients had no further lesions. The remainder had some recurrences: in 12 cases these were less frequent than before treatment or subsequently improved as a result of further courses of treatment, but 19 patients can be said to have derived little or no benefit.

There were no complaints of irritation by the creams, except that a few patients tended to have nasal irritation and sneezing with hibitane. Only one case of drug sensitisation was observed, when the use of penicillin cream evoked a mild rash in a girl.

The following are examples of the methods and results. Four are successes and one a failure.

Case 1.—A car-salesman, aged 35, was first seen on Jan. 1, 1955, with a severe boil on the left side of his nose, an associated pyrexia, and systemic disturbance. *Staph. pyogenes* was isolated in large numbers from his anterior nares and boil, and these proved to be of the same phage-type (3b/3c/51) and penicillin-sensitive. The patient had a previous history of boils recurring every six months for the previous five years.

Initial treatment was a five-day course of systemic chloramphenicol (2 g. daily) in view of the severe general reaction to the local lesion, but in spite of this treatment nose swabs remained positive for *Staph. pyogenes*. He was then given a ten-day course of 1% penicillin antibacterial cream for topical administration to the nares. This successfully suppressed the staphylococcus, and follow-up nose swabs in July and October, 1955, and July, 1956, were all negative for the organism. At the end of two years' follow-up he had had no recurrence of boils. His own comment was that he had never been so clear for many years.

Case 2.—A boy, aged 13, was first seen on Jan. 27, 1955, with sepsis of his right hand and two years' history of boils on his nose and buttocks. Previously he had had three courses of systemic penicillin. Penicillin-sensitive *Staph. pyogenes* type 47 was isolated from his nose and lesion, and in February, 1955, he was given a course of penicillin nasal cream. This failed to suppress the staphylococcus, and he had another lesion in July. A second course of nasal cream (penicillin plus erythromycin) was given after this lesion had subsided, but after a short period of absence the staphylococcus returned to the nose, and a stye recurred in September, and a boil in the neck in October. After this he had a third course of nasal penicillin cream, which suppressed the nasal staphylococcus for some months, and he had no lesions until July, 1956, when he had boils of his left ear and chin, and *Staph. pyogenes* was isolated from his nose. Hibitane-bacitracin cream was given, but this did not suppress the nasal staphylococcus, and he continued to have recurrent styes and septic spots on his face through October. All the family contacts were negative for nasal carriage.

This case must be considered a failure so far as treatment is concerned, but it reveals a significant association between the nose and the lesions.

Case 3.—A warehouseman, aged 38, reported in April, 1955, with recurrent dermatitis of his face and multiple boils (sycosis barbæ). From June to August, 1954, he had had recurrent multiple boils on his face and neck and was off work for more than five weeks. He was given two courses of systemic penicillin therapy. From October until December, 1954, he had a full course of staphylococcus vaccine.

In spite of these treatments penicillin-sensitive *Staph. pyogenes* type 42E/47 was isolated in large numbers from his nose and lesions. He was once again given a five-day course of systemic penicillin in the form of 600,000 units of 'Distaquaine G' daily, but on May 9, 1955, his face was still infected, although nose swabs were negative for *Staph. pyogenes*. , On June 27 lesions were still appearing, and *Staph. pyogenes* type 42E/47 was obtained in large numbers from his nose and skin. On July 2 a ten-day course of 1% penicillin nasal cream was started. A post-treatment swab on July 20, 1955, was negative, and follow-up swabs since then have remained negative for *Staph. pyogenes*.

In July, 1956, the patient had a recurrence of dermatitis on his face, but his nose swab was negative, and there was no associated sepsis. The dermatitis was successfully treated with 1% ichthyol ointment.

Case 4.—A carpenter, aged 25, reported on May 11, 1955, with a boil on his left arm. He had a history of frequent recurrent boils on the arm and on the back of his neck during the previous two years. Nose and lesion swabs both yielded large numbers of penicillin-sensitive *Staph. pyogenes* type 3a/3b. After his presenting lesion had subsided under local treatment, his nose was still positive for *Staph. pyogenes* type 3a/3b, and a ten-day course of 1% penicillin nasal cream was started. This suppressed the staphylococcus, and there was no recurrence until November, 1956, when he had a small septic spot; at this time his nose and skin were negative, and infection presumably came from some outside source. The fact that there has been no further recurrence confirms this.

Case 5.—A girl, aged 3 months, born in a maternity hospital, was seen on Sept. 30, 1956, with severe pyrexia and a very large gland, about the size of a golfball, on the left side of her neck. Systemic crystalline penicillin G was given immediately but had no significant effect; added sulphonamide had some effect on the pyrexia but not on the size of the gland.

Nasal swabs from this child and from her mother produced *Staph. pyogenes* type 7/54/77 resistant to penicillin, streptomycin, aureomycin, and oxytetracycline but sensitive to chloramphenicol and erythromycin. The gland was opened at the Sick Children's Hospital, Edinburgh, by Mr. Mason Brown, and *Staph. pyogenes* type 7/54/77 was isolated from the pus. The noses of mother and child were treated with hibitane neomycin nasal cream, which suppressed the nasal staphylococcus for at least six months, in which time there was no recurrence of infection.

Bacteriology

173 (93%) of the 189 patients examined and followed up were persistent nasal carriers of *Staph. pyogenes*. The organism could not be isolated from the nares or skin of the remaining patients.

154 (81%) of the 189 lesion swabs were positive for *Staph. pyogenes* on first examination. In 28 cases failure to isolate the organism was due to the fact that the lesions were "closed" (not yet discharging) and it is of interest to note that *Staph. pyogenes* was rarely isolated from the intact surfaces covering such lesions. In the 7 remaining cases failure to isolate the organism was attributable to previous systemic antibiotic therapy.

Of the 154 patients with positive lesion swabs 140 were nasal carriers, and 128 (92%) of these had an organism identical in phage type in both sites. In 12 patients organisms of different phage type were isolated from nose and lesion; and in 14 patients *Staph. pyogenes* was isolated from the lesion but not from the nose.

Antibiotic Sensitivity of Strains

75% of all the strains isolated were sensitive to less than 0·1 μg. of penicillin per ml. and produced no penicillinase. All the remaining strains were resistant to penicillin (0·1 μg. per ml.) and produced penicillinase. The penicillin-resistant strains were not of any particular phage type or group. Only a small minority of strains were resistant to streptomycin, chloramphenicol, and the tetracyclines. No strains resistant to erythromycin, neomycin, bacitracin, polymyxin, or hibitane were isolated.

Bacteriophage Typing

The strains isolated comprised a large number of distinct bacteriophage types (Williams and Rippon 1952), which belonged predominantly to groups I and II (table I).

Effect of Antibacterial Cream in Nares

In all the patients treated with antibacterial cream there was a marked fall in the number of colonies of staphylococci isolated from nasal-swab cultures taken shortly after the end of the treatment. Two weeks after the treatment had been stopped no colonies of *Staph. pyogenes* were isolated from 102 of 127 cases (table II). Penicillin and the other major antibiotics were the most effective: in 70% of the patients *Staph. pyogenes* was suppressed for four weeks after application of the cream had ceased, and even after twenty weeks about a third of the patients were yielding negative nose swab cultures. The results with hibitane, and with hibitane combined with neomycin and bacitracin, were not quite so good; in most

TABLE III—CHANGES OF CARRIER STRAIN IMMEDIATELY OR SHORTLY AFTER TREATMENT WITH ANTIBACTERIAL CREAM

Case no.	Original strain		Antibacterial used*	Replacement strain		Final observed strain after follow-up period	
	Phage-type	Penicillin sensitivity		Phage-type	Penicillin sensitivity	Phage-type	Penicillin sensitivity
6	3a/3b/51	Sensitive	P	3a/3b/51	Resistant	3a/3b/51	Resistant
7	†nt	Resistant	C	42e	Sensitive	42e	Sensitive
8	52/52a	Sensitive	P	7/47/54	Resistant	52/52a	Sensitive
9	3a/3b/3c	,,	P	3a/3b/3c	Resistant	3a/3b/3c	Sensitive
10	53/76	Resistant	T	52	Sensitive	52	Sensitive
11	42e/47	Sensitive	P	42e/47	Resistant	42e/47	Sensitive
12	52a	,,	P	52a	,,	52a	Sensitive
13	3a/3b/3c	,,	P	3a/3b/3c	,,	3a/3b/3c	Resistant
14	3b/3c	,,	P	42b/52	,,	42b/52	Resistant
15	nt	,,	Hib	7/47/75/77	,,	3a/3b	Sensitive
16	3c/51	,,	Hib	77	,,	77	Resistant

* C, chloramphenicol. P, penicillin. T, oxytetracycline. Hib, hibitane. † not typable.

of the patients treated with these preparations, suppression lasted less than four weeks.

From 11 patients receiving antibacterial cream, strains of *Staph. pyogenes* whose antibiotic sensitivity differed from that of the original carrier strain were isolated. These were all changes in resistance to penicillin.

In 7 patients treated with penicillin, and also in 2 treated with hibitane, the original penicillin-sensitive strain was suppressed and apparently superseded by a penicillin-resistant strain, which was often of a different phage type. In 4 of these 9 patients the change of strain was temporary, and within a few weeks the original penicillin-sensitive strain had fully re-established itself. However, in 4 of those remaining the penicillin-resistant strain persisted throughout the follow-up period. On the other hand, 2 patients whose strains were penicillin-resistant were colonised with penicillin-sensitive strains after treatment with chloramphenicol and oxytetracycline. There was no change in the sensitivity of either strain to chloramphenicol or to tetracycline. The phage-type patterns and antibacterial sensitivity of the strains are shown in table III (cases 6–16).

Discussion

The proportion of persistent nasal carriers of *Staph. pyogenes* in this practice was similar to that usually found among the non-hospital population (Gould and McKillop 1954). The incidence of cases of staphylococcal infection was about 5% per annum, and this rate has not fluctuated to any significant degree in this practice in recent years. The number of episodes of infection per patient averages 2–3 per annum; hence a doctor in a similar non-industrial practice can expect to see 200–300 lesions each year. In industrial areas a relatively large number of infected wounds are found; but, as these are rare in this practice, they were purposely excluded.

The nose is the primary site of colonisation by *Staph. pyogenes* and the main source of the organism which contaminates other sites on the body and the environment. In hospital nasal carriers are numerous and are the source of the staphylococci which contaminate patients and infect their wounds. Thus staphylococcal infections contracted in hospital are cross-infections and exogenous in at least 90% of cases (Gould and Allan 1954), for the organisms in the lesions are identical with those carried by the hospital personnel.

Our present observations show that the great majority of infections examined in this general practice occurred in persistent carriers and were due to staphylococci identical with those in the nares of the carrier. Thus the infection in these cases was endogenous, and the source must be the patient's own nose. It is known that nasal carriers disseminate the staphylococci to various degrees (Hare and Thomas 1956). Dissemination takes place over the carrier's skin by direct and indirect contact with the nose; the carrier's clothes and handkerchief become heavily impregnated with the staphylococcus, and eventually all areas of the body must come into contact with the organism. In the nasal carrier the areas exposed to heaviest contamination with staphylococci are the face, neck, and hands; so we find most of the lesions at these sites. However, other factors probably predispose to infection—e.g., washing with soap and water, which will temporarily remove secretions inhibitory to staphylococci, and frictional damage such as is caused by the collar band.

In a minority of our cases, where there was no evidence of nasal carriage or the staphylococci in the lesion were not the same as those in the nose, it is likely that the infection was exogenous. In family epidemics a carrier in the family is usually the source. In other epidemics contact may be made with carriers at work. This would explain some of the differences between our figures and those of Roodyn (1954), because a higher proportion of his patients may have been occupationally at greater risk than ours.

The staphylococci concerned in these infections in general practice were very different from those found in most hospital infections. Phage-typing showed that a very large number of different strains were concerned, and in most cases the strain was identified with the patient; this is in contrast to hospital studies, when a single strain, or at most a few strains, are responsible for the infections in each hospital (Gould and Allan 1954). In addition, nearly all the hospital strains are penicillin-resistant, and often they are resistant to other antibiotics. The strains we have observed in general practice are predominantly sensitive to penicillin, and very rarely were strains resistant to the other antibiotics isolated; when they were, the patient had a history of either admission to hospital or of long-continued exposure to the antibiotics concerned.

Staph. pyogenes persistently colonising the nares may be suppressed by the topical application of antibacterial creams (Gould and Allan 1954, Gould 1955, Rountree et al. 1956), and this has been shown to decrease the dissemination of the organism from the nares (Duguid and Gould). In hospital the control of carriers in this way has diminished cross-infection (Gould and Allan 1954) and controlled endogenous skin infection (Tulloch 1954). The method is the more useful because the suppression of the staphylococcus lasts longer than the period of application of the cream. After ten days' treatment the staphylococcus is absent from nose-swab cultures for a further period of two weeks in 90% of patients, four weeks in 60%, eight weeks in 40–50%, and twenty weeks in 25% (Gould 1955, 1957).

The present patients treated with nasal antibacterial creams were persistent carriers of *Staph. pyogenes*, and the results of suppression of the organism in the nose agree with the expected results. Suppression of the staphylococcus has been associated with freedom or reduction in the frequency of recurrence of lesions in 85% of patients,

and those who failed to show clinical improvement were those in whom the nasal staphylococcus was not successfully suppressed. Exacerbation of recurrences was always associated with reappearance of the organism in the nose in large numbers, although in many patients the nasal staphylococcus reappeared after various periods without recurrence of lesions. Efforts to continue suppression of the nasal staphylococcus by repeated courses of treatment with antibacterial creams would probably prevent recurrence entirely.

Penicillin, streptomycin, chloramphenicol, and the tetracyclines, used in the way we have described, are more or less equally effective in suppressing the staphylococcus in the nose; but there are drawbacks, potential and real, to the use of these agents for this purpose. The development of antibiotic-resistant strains and their subsequent spread may be encouraged, and the patient may become sensitive to the antibiotic. It is true that we have had very few instances of change in antibiotic resistance during treatment with antibiotics, and in only 5 cases did the change persist. There is a danger, however, and it will be greater where cross-infection with resistant (or potentially resistant) strains can occur—e.g., in hospital. We have experienced only 1 case of mild drug sensitivity to penicillin, but here again the danger to the patient exists.

For these reasons it would be desirable to use an antibacterial agent which is unlikely to be used systemically. So far we have not found such an agent with antistaphylococcal powers as powerful as those of penicillin. Hibitane combined with neomycin (0·5%) or with bacitracin (2000 units per g.) has been quite effective by bacteriological assessment but tends to be associated with slight irritation of the nares when the concentration of hibitane is higher than 0·5%. No strains resistant to these agents have yet developed in our series; nor have there been any examples of sensitisation. Most nasal carriers should be able to suppress their staphylococci by applying such preparations to the nose for one week in every four, and this should prevent recurrence of staphylococcal lesions.

Summary

The proportion of persistent nasal carriers of *Staph. pyogenes* among patients in a general practice was 33%. 84% of these strains were sensitive to penicillin and the other antibiotics, and most were of phage-types in group I or group II.

5% of the patients in the practice had one or more staphylococcal lesions each year, of which 99% were superficial. 95% of the lesions responded to local conservative treatment, and the remainder to systemic penicillin therapy.

Of 189 patients with lesions who were examined 54% had had recurrent staphylococcal infections in the previous two years. 93% of these patients were persistent nasal carriers. In over 90% of the cases where staphylococci were isolated from both lesion and nose, they were identical in phage-type. It is concluded that most cases of staphylococcal infection among these patients were autogenous, and the route of infection was by direct or indirect contact with the nose. The commonest sites of the lesion were on the head and neck, hands, and forearms.

127 persistent nasal carriers, including 87 with recent history of recurrent lesions, were treated with local antibacterial nasal cream to suppress the nasal staphylococcus. This much decreased the number of recurrent lesions in the post-treatment period compared with the pre-treatment period. 'Hibitane' (bis-*p*-phenyldiguanidohexane) 0·5% combined with neomycin sulphate (0·5%) or with bacitracin (2000 units per g.) were satisfactory alternatives to the antibiotics.

Recurrent staphylococcal infections in nasal carriers may be prevented by applying an antibacterial cream to the nose for one week out of four.

We wish to thank Dr. R. H. A. Swain and Dr. J. P. Duguid for their interest and advice; Dr. K. G. Green, of Imperial Chemical (Pharmaceuticals) Ltd., for supplying 'Hibitane' salts and nasal creams; and Upjohn of England, Ltd., for supplying neomycin sulphate.

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THE HEALTH SERVICE IN 1956

THE Ministry of Health's report on the National Health Service in 1956[1] includes encouraging figures on the reduction of hospital waiting-lists. During the year the number of patients awaiting admission fell by 24,000 from 455,000 to 431,000. (At the end of 1953, 526,000 were awaiting admission.)

Since 1949 the number of available and occupied beds has increased by about 6%, but the number of patients treated (measured by discharges and deaths) has risen by some 27%. Mental and mental-deficiency patients treated in 1956 increased by 9000, and other patients by 78,000, over the totals in 1955; these increases amounted to 7·8% and 2·2% of the previous totals.

In 1956, as in 1955, the hospital departments with the largest waiting-lists were general surgery, ear, nose, and throat, other surgical, and gynæcology. Surgery waiting-lists declined slightly at non-teaching hospitals and London teaching hospitals between 1955 and 1956, and there was a small fall in the estimated waiting-time for admission to the latter; at provincial teaching hospitals waiting-lists increased slightly and there was a small rise in the average waiting-time for admission. More significant changes appear to have taken place in the ear, nose, and throat departments:

> Between 1955 and 1956 waiting-lists declined by about 16% at non-teaching hospitals and by about 20% at both groups of teaching hospitals. The average waiting-time fell by about a month at non-teaching hospitals and by 34 days and 24 days at London and provincial teaching hospitals. The average waiting-time is now about four and a half months at non-teaching hospitals and provincial teaching hospitals and some three months at London teaching hospitals.

The most significant increases in waiting-lists between 1955 and 1956 were in gynæcology, traumatic and orthopædic surgery, and other surgery at non-teaching hospitals. At the teaching hospitals waiting-lists in these departments did not increase, apart from traumatic and orthopædic surgery at the London teaching hospitals.

Mental Health Services

At the end of 1956 there were 138,215 patients in the designated mental hospitals, excluding former public-assistance institutions. On recognised space standards, and excluding ward space out of use at the time, these hospitals would have provided 121,213 beds for patients; and the average overcrowding was 14·0%, compared with 14·8% a year earlier.

In the mental-deficiency hospitals the number of beds in use on authorised standards at the end of the year was

1. Report of the Ministry of Health for the year ended Dec. 31, 1956. Part I. 1. The National Health Service. 2. Welfare, Food and Drugs, Civil Defence. Cmd. 293. H.M. Stationery Office. Pp. 241. 11*s*.

48,757—an increase of 1370 during the year. There were 53,533 patients in residence (including 1031 on short licence); and the accommodation was overcrowded by 9·8%, compared with 11·7% at the end of 1955.

Tuberculosis

During 1956, beds earmarked for patients with respiratory tuberculosis were reduced from 31,900 to 28,598.

Consultants

The number of consultants increased during the year by 89 to a total of 6739.

The numbers of distinction awards current at the end of last year were: A (£2500 per annum), 269; B (£1500), 673; C (£500), 1347.

Nurses and Midwives

The number of student nurses increased in the nine months ended Sept. 30, 1956, from 48,834 to 51,498—the highest number recorded since the introduction of the National Health Service in 1948.

The number of pupil midwives decreased by 151 from 3710 to 3559. "The difficulty of obtaining enough trained midwives to serve the needs of the maternity hospitals continued to cause concern."

GENERAL MEDICAL SERVICES

Between July 1, 1952, and July 1, 1956, the number of principals providing unrestricted medical services increased from 17,204 to 19,082—an increase of 1878 or 10·5%. In the same period the number of single-handed practitioners decreased from 7459 to 6568—a decline of 12·6%. In this period the number of principals in partnership increased from 9745 to 12,514, representing 56·6% and 65·6% of the totals.

There has been a steady decline in the number of people living in under-doctored areas—from 21 million in 1952 to 9½ million in 1956—and by far the greater part of the population is now living in adequately doctored areas (34 million in 1956, compared with 20 million in 1952). The average number of patients per doctor decreased from 2436 in 1952 to 2272 in 1956.

In 1956 the number of doctors admitted to medical lists was 960, making a net increase of 297. In 1955 and 1956 the number of assistants rose, having fallen in previous years. The numbers at July 1 in each of the years from 1952 to 1956 were: 1689, 1596, 1504, 1515, and 1546.

Prescribing

The cost of medicines and appliances ordered or supplied by doctors again increased, without taking into account the increase in the remuneration for dispensing which was applicable to prescriptions dispensed during the year.

In January the average cost per prescription in England and Wales was 55·60*d.* and in November (the last month before a revised system of prescription charges was introduced) the average cost was 61·52*d.* As in previous years there were wide differences in the average annual cost of pharmaceutical services per person on doctors' lists between different parts of the country. Examples of pairs of nearby towns with noticeably differing costs are Bootle with £1 3*s.* 8*d.* and Blackburn with £1 18*s.* 4*d.*, and Tynemouth with £1 2*s.* 5*d.* and South Shields with £1 15*s.* 2*d.*

GENERAL DENTAL SERVICES

The volume of dental treatment has increased disproportionately to the growth in man-power. The extra volume is due partly to the fact that the younger dentists replacing their old colleagues who have retired can usually work for more sustained periods. "Nevertheless, it is apparent that dentists as a whole, by more efficient organisation of their practices, by working longer hours, by devoting more of their time to the General Dental Services, or by a combination of these factors, continue to provide an increasing amount of treatment."

Patients in the priority classes (those under 21 years of age and expectant and nursing mothers) continued to have an increasing share of the treatment under the service. This was particularly noticeable in the case of children under 15 years of age, who received nearly 30% of the courses of treatment provided under the general dental services in 1956, compared with 28% in 1955, and only 7·3% in 1949.

Dentists on the Dentists Register at the end of 1956 numbered 16,007, compared with 15,895 at the end of 1955. At the end of 1956, 9924 dentists were in the service, representing a net increase of 136 over the number a year before. At the beginning of the academic year 1956–57 647 students were admitted to dental schools in England, Wales, and Scotland, compared with 622 in the preceding year. The number entering the first year of the professional course was 582 in 1956–57, compared with 558 in 1955–56.

GENERAL MEDICAL COUNCIL

SESSION NOV. 26-29

Sir DAVID CAMPBELL'S address at the opening of the Council's 195th session was summarised last week (p. 1108).

BRITISH PHARMACOPŒIA, 1958

Dr. H. GUY DAIN presented the report of the Pharmacopœia Committee, which incorporated the report of the British Pharmacopœia Commission. He announced that arrangements had been made for the new *British Pharmacopœia* to be available for sale by March 3, 1958, and it would become effective on Sept. 1, 1958.

APPLICATION FOR REMOVAL OF NAME

Before the Council was an application from a registered medical practitioner for the removal of his name from the Register. The PRESIDENT said that the practitioner had pointed out that there were certain reasons why his name should be removed. He had applied to the Royal Colleges of Surgeons of England and Physicians of London, which issued his diploma, and they had intimated that they had no objection to the removal of his name.

On the recommendation of the executive committee the Council agreed to remove from the Register the name of *Harold George White Cook*.

RECOGNITION OF UNIVERSITY COLLEGE, IBADAN

The Privy Council had invited the Council's observations on a proposal by the University of London to recognise University College, Ibadan, Nigeria, as an institution whose students could be admitted to the M.B., B.S. examinations.

Dr. E. R. BOLAND said that he had inspected the hospital and school. It was an extremely modern hospital with full departments and ancillary services, and he thought it would challenge comparison with any hospital in this country. The inspectors of the university had made proposals for strengthening the surgical teams. They suggested that recognition should be provisional so that certain staffing additions could be made.

The Council agreed to the recognition of University College, Ibadan, for admission of students to examinations for qualifications registrable under the Medical Act.

MEDICAL ACT ANOMALIES

The PRESIDENT recalled that a year ago the Council approved two minor amendments of the Medical Act, 1956, to cover two anomalies. A man from a foreign country who took a registrable qualification would, even though he had had considerable hospital experience, have to do six months' surgery and six months' medicine. The Council suggested a minor amendment to permit recognition of such an individual. The second group were those who took a registrable qualification before 1953 but did not put their names on the Register; for example,

they went to the West Indies or South Africa and became registered there, then when they wanted to be registered in Britain they had to do the preregistration year although they might have done far more elsewhere.

In order to overcome these anomalies it was suggested that a private Member's Bill might be introduced in the House of Commons under the ten-minute rule. But there was a third matter which many members of the Council thought of equal or greater importance, and that was the provision in the Act that before an individual could become provisionally registered he must not only pass the examination but also prove that he had been appointed to a post in a hospital. This created administrative difficulties. It did not apply in Ireland. The executive committee thought that amendment was desirable. If these three proposals were approved, they would see what could be done in one House, and if there were any difficulties the matter could be approached elsewhere.

Dr. J. G. McCRIE said that the Conference of Provincial Deans viewed with trepidation the abolition of the certificate of selection but recognised that this applied only to the first appointment and not to the second, over which they had no control.

The action proposed by the President was approved. The Council considered other matters in camera.

Medical Disciplinary Committee

The committee began its session on Nov. 27, under the chairmanship of the President.

APPLICATIONS FOR RESTORATION

The committee directed that the names of *Basil Arthur Furniss*, *Sumatapalage Reginald Gunewardene*, and *Frank Stanley Mellows* be restored to the Register.

The committee did not restore to the Register the name of *Robert Vivian Storer*.

NAMES NOT ERASED

Judgment against *Adam Clark*, registered as of 139A, Riddiford Road, Wellington, S.I., New Zealand, L.M.S.S.A. (1929), who had been convicted of conspiring to cheat by administering drugs to dogs in greyhound races, had been postponed for two years. In view of satisfactory information concerning Dr. Clark's conduct, the committee did not erase the name of Adam Clark.

The committee took a similar course in respect of *Clarence James John Silveira*, registered as of 34, Hodgkin Park Crescent, Benwell, Newcastle upon Tyne, 5, M.B. Durh. (1944). In November, 1956, the committee found that he had canvassed for the purpose of obtaining patients.

John Kelvin, registered as of 1446, Dumbarton Road, Glasgow, W.4, L.R.C.P.E. (1925), M.B. Leeds (1926), appeared for judgment postponed for two years in November, 1955, on a charge of being associated with an organisation known as Akers' Hair and Scalp Clinics in the United States, which systematically procured or sanctioned reports and advertisements directing attention to his professional skill and of holding a press conference in Chicago. The committee judged him guilty of infamous conduct in a professional respect, but were satisfied with the information given them confidentially as to his conduct since then, and did not direct the Registrar to erase his name.

ERASURE

John Bodkin Adams, registered as of 6, Trinity Trees, Eastbourne, M.B. (1921), M.D. (1926) Belf., D.P.H. Brist. (1922), appeared on a charge of having been convicted upon his own confession at Lewes Assizes on three indictments, on which he was fined a total of £2400 and ordered to pay the costs of the prosecution. The first indictment contained eight counts of forging with intent to defraud, six of them concerning National Health Service prescription forms. The second indictment contained three charges of making false representations that he had no pecuniary interest in the deaths of individuals, with a view to procuring the burning of their remains; and the third indictment concerned wilfully obstructing a police-constable, wilfully attempting to conceal certain drugs, and failing to keep a register or other records as required by the Dangerous Drugs Regulations. Dr. Adams was represented by Mr. N. Leigh Taylor, of Messrs. Hempsons, solicitors to the Medical Defence Union. He admitted the convictions.

Mr. G. J. K. Widgery, solicitor to the Council, said that it was improper for a doctor under the National Health Service to issue a prescription for medicine or appliances to one of his private patients, and it was clearly criminal to forge the name of another practitioner on a prescription or to send a prescription in another doctor's name without his authority. The second indictment concerned offences under the Cremation Act, 1902. Dealing with the last indictment, Mr. Widgery produced a list of drugs obtained by Dr. Adams from an Eastbourne chemist. Dr. Adams had stated that he had not bought any dangerous drugs for years. Dr. Adams resigned from the National Health Service on June 30 last. His authority under the Dangerous Drugs Act was withdrawn by the Home Office on Sept. 4.

The President announced that, by virtue of the conviction that had been proved against him, the committee had directed that the name of John Bodkin Adams be erased from the Medical Register. This is subject to appeal within twenty-eight days.

PROVISIONALLY REGISTERED PRACTITIONER

The committee held the first disciplinary inquiry into the conduct of a provisionally registered practitioner. *Hari Shankar Badve*, provisionally registered as of Central Talkies, Malegaon (Nasik), Bombay, India, M.B. Bombay (1953), was charged that, being provisionally registered under the Medical Acts, he, in a letter dated Sept. 15, 1956, applying for full registration, stated that he held appointments as house-physician and house-surgeon at the P.P. General Hospital, Bombay, which he knew to be false, and that with a further letter, dated Oct. 19, 1956, he forwarded a certificate purporting to have been given and signed by Mr. Homi Shapurji Mehta, M.B., M.S. Bombay, whereas the certificate had not in fact been given and signed by Mr. Mehta.

The President announced that the committee considered that the facts proved were abundantly capable of supporting a finding of infamous conduct in a professional respect. The committee had taken into consideration representations and testimonials in Dr. Badve's favour. In the circumstances they had determined to postpone judgment for six months, until their meeting in May, 1958.

CASES CONCLUDED

Alexander Winchester St. Clair Greig, registered as of 26, Kersland Street, Glasgow, W.2, M.B. Glasg. (1935), had had judgment postponed for two years in November, 1955. The President announced that the committee had determined that the Registrar should not be directed to erase his name.

Joseph White O'Brien, M.C., registered as c/o W. H. Winder and Woodhouse, solicitors, 23, Sun Street, Lancaster, M.B. N.U.I. (1914), also appeared at the end of two years for postponed judgment. His name was not erased.

FURTHER POSTPONEMENT

In the case of *Joseph John McMenemy*, registered as of Burnside, Bargeddie, Glasgow, L.A.H. Dubl. (1947), who was not present, judgment had been postponed until May, 1957, following convictions in 1954 and 1955 of being in charge of and driving a motorcar when under the influence of drink. In May it was stated that the practitioner was abroad and that his present address was unknown; the case was stood over until the present session.

The President announced that the committee were not satisfied that the evidence so far received warranted them in discharging the case at present. They had determined to postpone judgment for a further six months, until May, 1958.

Mr. C. P. Harvey, Q.C., the legal assessor, said that when the committee were in camera he was asked whether, if the committee thought it the right thing to do, there would be any means of obtaining evidence from America or elsewhere. He advised that statutory declarations or their equivalent could be obtained, or they could possibly arrange for those concerned in America to make statements in circumstances which would enable Dr. McMenemy or his legal advisers to participate and cross-examine.

JUDGMENT POSTPONED

David Philip Lewis-Badgett, registered as of Manor Lodge, Mossley, Manchester, L.R.C.P.E. (1936), was charged with being convicted at Loughborough Magistrates' Court in 1951, after pleading guilty, of being in charge of a motorcar when under the influence of drink or drugs, for which he was fined £50, ordered to pay £7 8s. costs, and had his licence suspended for 12 months, and at Lancashire County Quarter Sessions in 1955 of being in charge of a motor-vehicle when under the influence

of drink, for which he was fined £100 and disqualified from driving for three years.

The committee found the convictions proved. To give Dr. Lewis-Badgett an opportunity to overcome his tendency to drink to excess they postponed judgment for six months, until May, 1958.

INQUIRY ADJOURNED

"I have had great difficulty in this case in obtaining any information. We have experienced difficulty in Scotland but not hitherto in Ireland." Mr. Widgery stated this in the case of *Arthur Alfred Hill*, registered as of 25, Holywood Road, Belfast, M.B. Belf. (1926). One conviction against Dr. Hill was in 1950 for driving a motorcar when under the influence of drink, when he was fined £5. A second conviction was on an indictment of supplying tablets to another person with intent to procure a miscarriage. On this at Belfast City Commission he was sentenced to three months' imprisonment.

The President announced that the committee had decided to adjourn the inquiry in this case until May in order that the Council's solicitor could obtain further information on the circumstances of the second conviction.

ERASURE

William Frederick Howson Ray, registered as of Kennoway, Ashley Road, Hale, Cheshire, M.R.C.S. (1926), M.R.C.P. Lond. (1929), B.M. Oxon. (1927), was charged with behaving improperly to and having sexual intercourse with a woman patient now dead.

The committee judged Dr. Ray guilty of infamous conduct in a professional respect and ordered his name to be erased from the Register. This is subject to appeal within twenty-eight days.

JUDGMENT POSTPONED FOR A YEAR

Robert Cremona, registered as c/o Midland Bank Ltd., 62, Westbourne Grove, London, W.2, M.B. Cantab. (1951), admitted pleading guilty at Bow Street to obtaining 30 tablets of 'Dicodid' and 100 tablets of 'Suavitil' by means of a forged National Health Service prescription and procuring for himself 30 tablets of dicodid, contrary to the Dangerous Drugs regulations. On the first charge he was fined £5, 13 similar offences being taken into consideration; and on the second £5, 10 similar offences being taken into consideration. The President said that the committee took a grave view of convictions of this nature, and felt it necessary to satisfy themselves as far as possible that there would be no repetition. For this purpose they had determined to postpone judgment for a year.

The committee also postponed judgment for a year in respect of *William David Smith*, registered as of 118, Marlborough Park Central, Belfast, M.B. Belf. (1940). He had been convicted in 1956 of being in charge of a motorcar when under the effect of drink or drugs and had been fined £15 with an alternative of three months' imprisonment; and in 1957 of being in charge of a motorcar when under the influence of drink or drugs, when he was fined £50 with an alternative of six months' imprisonment.

JUDGMENT POSTPONED

John Miller Hunter Mitchell, registered as of 96, Spottiswoode Street, Edinburgh, 9, M.B. Edin. (1940), had been found guilty of offences at Portsmouth in July and at Edinburgh in August. Mr. Baylis, of Messrs. Hempsons, on behalf of the Medical and Dental Defence Union of Scotland, said that it was hoped that psychiatric treatment which Dr. Mitchell was undergoing would help him to adjust to the disability from which he freely admitted he suffered.

The committee postponed judgment for two years, until November, 1959.

IMPROPER ASSOCIATION: NO ERASURE

Gwyn Rhys Morgan, registered as of Bodringallt Villa, Ystrad, Rhondda, Glam., M.R.C.S. (1933), was charged that he entered into and maintained an improper association with Mrs. Rachel Ann Price, of 8, Carne Street, Pentre, Glamorganshire, a patient, as a result of which her husband left her, that he committed adultery on numerous occasions, and that in relation to the facts alleged he was guilty of infamous conduct in a professional respect.

The President announced that the committee found the charge of adultery not proved to their satisfaction but they found the other charges proved. In all the circumstances, however, they felt justified in recording that he was not guilty of infamous conduct in relation to the matters alleged against him.

Public Health

DEATH FROM ASIATIC INFLUENZA IN THE NETHERLANDS

J. F. PH. HERS
M.D.
LECTURER IN LUNG DISEASES

W. R. O. GOSLINGS
M.D.
HEAD OF THE DEPARTMENT OF INFECTIOUS DISEASES

N. MASUREL
BACTERIOLOGIST

J. MULDER
M.D.
PROFESSOR OF MEDICINE, AND HEAD OF THE DEPARTMENT OF MEDICINE,
UNIVERSITY OF LEYDEN

BEFORE the present epidemic of Asiatic influenza in the Netherlands had spread widely among the civil population, all morbid pathologists were asked to store their necropsy material from fatal clinical cases of influenza as cold as possible. A transport service was organised to bring this material to the virus laboratory of the Clinic for Internal Medicine at Leyden. The lungs and, in some cases, the trachea also were examined virologically and bacteriologically (penicillinase being used). Smears from the ciliated epithelium of each trachea were examined for cytological alterations supporting the tentative diagnosis of influenza. In 101 of 103 tracheæ such alterations were definitely present, resembling those previously described by Hers and Mulder (1951).

Isolation of Virus by Lung Puncture in Fatal Cases

From fatal cases virus and secondarily infecting bacteria can be obtained by puncturing the lungs with a thick needle when a necropsy cannot be done. A strain of Asiatic virus was isolated post mortem in this way from 8 of 16 cases.

Bacteriology

Table I summarises the bacteriological findings in 103 cases of fatal influenza from which a strain of Asiatic virus was isolated from the lungs, including 6 cases dying late in the disease, from which the blood taken from the heart showed a positive titre in the hæmagglutination inhibition test against the strain A-Asia-Japan 305/57 (being about 10% of the deaths reported). From this table the following conclusions can be drawn: (1) Asiatic influenza can be fatal in any age-group; (2) more than half the deaths are caused by *Staphylococcus aureus*; and (3)

TABLE I—BACTERIOLOGICAL FINDINGS IN LUNGS OF 103 VIROLOGICALLY CONFIRMED FATAL CASES OF ASIATIC INFLUENZA

Age-group (yr.)	No. of cases	Sex		*Staph. aureus*	Hæmolytic strep. group A	Pneumococcus	*Hæmophilus influenzæ*	*Esch. coli*	No flora
		M	F						
0–5	9	7	2	6[a,d]	..	2[g,h]	1[i]	..	..
6–10	16	9	7	14	..	..	..	..	2
11–20	14	5	9	14	..	..	..	..	..
21–30	13	5	8	9	..	..	..	1	3
31–40	13	6	7	6[f]	1	1[g]	..	1	4
41–50	3	2	1	..	..	..	..	1	2
51–60	14	8	6	7[e]	..	..	..	3	4
61–70	18	14	4	11[b,c,e]	..	..	..	..	7
71–80	2	2	..	2	..	..	..	..	..
81–90	1	1	..	..	..	..	..	1	..
Total	103	59	44	69	1	3	1	7	22

a, + pneumococcus type 19 (1 case).
b, + pneumococcus type 17 (1 case).
c, + pneumococcus type 15 + hæmolytic strep. group A (1 case).
d, + *H. influenzæ* (1 case).
e, + proteus (2 cases).
f, + *Ps. pyocyanea* (1 case).
g, type 23 (2 cases).
h, type 10 + *H. influenzæ*.
i, + pneumococcus type 6.

TABLE II—SENSITIVITY TO ANTIBIOTICS AND PHAGE-TYPE OF STRAINS OF *Staph. aureus* ISOLATED FROM CASES OF INFLUENZA PNEUMONIA

	No. examined	Sensitive	Resistant	Resistant to[2]						Phage group							
				P	S	C	A	T	E	No. examined	I	II	III	44B[3]	No.,[4] 80, 42E	NS[5]	NT[6]
Necropsy cases	108[1]	53 46%	61 54%	61 54%	36 32%	8 7%	19 17%	19 17%	2 2%	84	7 8%	10 12%	12 14%	9 11%	13 15%	1 1%	32 38%
Clinical cases	43	33 75%	11 25%	11 25%	3 7%	0 0%	0 0%	0 0%	0 0%	31	6 19%	7 23%	1 3%	2 6%	8 26%	1 3%	6 19%

1. In 6 cases two strains were isolated.
2. P, S, C, A, T, E, penicillin, streptomycin, chloramphenicol, aureomycin (chlortetracycline), terramycin (oxytetracycline), erythromycin.
3. 44B, phage adapted by us from phage 44, which has some local importance.
4. No, 80, 42E, strains typable by one or combinations of the phages mentioned, No being a phage adapted by us from phage 42E, closely related to phage 80 but not quite the same.
5. NS, non-specific pattern.
6. NT, non-typable by routine-phage-dilution; not yet typed by concentrated phages.

hæmolytic streptococci, pneumococci, and *Hæmophilus influenza* are rarely isolated.

In the young age-groups many of the cases complicated by infection with staphylococci ran a fulminant fatal course, with rapidly supervening shock from toxæmia.

Phage-types and Sensitivity to Antibiotics of Staph. aureus

Table II shows the results obtained. The reason why the number of antibiotic-resistant strains was greater in the fatal than in the non-fatal cases is not yet known. Perhaps many of the fatal cases had not received adequate antibiotic treatment, or perhaps treatment with antibiotics other than penicillin may be less effective in severe cases. One must remember also that superinfection with a resistant staphylococcal hospital strain is also possible in staphylococcal influenzal pneumonia.

Relation of Staphylococcal Influenzal Pneumonia and Staphylococcal Skin Lesions

We traced staphylococcal skin lesions either in the patient or in one or more members of his family in 19 cases by phage-typing. This type of investigation is not easy when one has to examine the patient's relations and friends. Sometimes a small staphylococcal skin lesion had not been noticed by the patient or by a relation or had been considered of no importance. Such a finding is of great practical importance because it may reveal danger to the influenza patient.

Influenzal Death in Mitral Stenosis

In 252 necropsies there were 10 cases of mitral stenosis and we have been informed of another 6 fatal cases. Many case-reports gave the same description of a severely ill dyspnœic patient, with abundant hæmorrhagic non-purulent sputum, deteriorating despite antibiotic treatment. From 9 cases Asiatic virus was isolated from the lung, bacteriological culture being negative. Macroscopically the lung resembled that of influenza-virus pneumonia in mice and ferrets.

2 cases were studied in our hospital. Both patients survived. We got the impression from the clinical symptoms and radiography of the lungs that there was no acute congestion of the lungs (with "hæmodynamic" œdema). Radiologically, focal bilateral consolidations of both lungs were seen. Asiatic virus was isolated from the hæmorrhagic sputum, which was bacteriologically sterile. In such cases it is possible that true virus lesions are present in the lungs, but the association with mitral stenosis and chronic pulmonary congestion remains unexplained. Careful histopathological studies of the lung tissue may shed light on this problem. So far we have found in two cases capillary necrosis and thrombosis in the lung tissue.

Pathogenecity of Asiatic Influenza Virus Isolated from Lung Tissue for Mice

We isolated 6 strains of Asiatic influenza virus by inoculating emulsion of lung tissue directly into mice. In no case did fatal virus pneumonia develop in the mice before the 4th passage. One of the mouse-lung adapted strains was cross-tested, after 22 passages, in the hæmagglutination-inhibition test with the strain A-Singapore 1/57 (egg line) and A-Asia-Japan 305/57 (which has undergone 3 ferret and 6 mouse passages) and did not show any deviation in antigenic composition, all three strains being identical. The M.L.D. for mice of this strain is $10^{-3.5}$ of a 10% emulsion of infective lung tissue, which is not very high.

We are indebted to all morbid pathologists in the Netherlands for their cooperation.

REFERENCE

Hers, J. F. Ph., Mulder, J. (1951) *J. Path. Bact.* **63**, 329.

Smoke-control Areas

The Minister of Housing and Local Government has confirmed five orders for the creation of smoke-control areas under the Clean Air Act, 1956. They are orders made by Bolton, Denton (Lancs), Hayes and Harlington (Middlesex), Ossett (Yorks), and West Bromwich; they cover a total area of 380 acres and include 920 buildings. The only other order which has been confirmed under the Clean Air Act dealt with the city centre of Liverpool. All the orders come into operation next year. With the exception of the West Bromwich Order, no objections to any of these orders were received.

In the case of West Bromwich, whose order covers 25 acres in the town centre and affects 250 buildings, objections were received from householders and were later heard at a public inquiry. The principal objections were: (*a*) that smoke nuisance from industries and the railways should be reduced before householders were required to burn smokeless fuel; (*b*) that coke fumes in houses suffering from downdraught were dangerous to health; and (*c*) that the cost of replacing or adapting fireplaces to burn smokeless fuels would cause financial hardship to persons on small fixed incomes.

In announcing his decision, the Minister states that, as West Bromwich suffers from substantial smoke pollution to which domestic chimneys are as much a contributory cause as industrial chimneys, he must take the view that the Corporation are entitled to use the powers conferred on them by Parliament to declare smoke-control areas. Dark smoke emitted from industry and the railway will be reduced when the remaining provisions of the Clean Air Act come into operation, and the replacement of steam by diesel trains has already started on the railway-line adjacent to the area. On the question of coke fumes the Minister states that there is no question of these being more harmful than those from coal; they are virtually the same. As for downdraught, the burning of coke will not increase this and may even improve it because of the higher temperature of the combustion gases. The trouble can often be remedied by the use of fires or stoves with restricted throats. Finally, the Minister points out that the cost of adapting and replacing fireplaces to burn coke ranks for a grant of not less than 70%, and that the Corporation have undertaken to consider sympathetically the payment of more than 70% in special cases.

International Control of Infectious Diseases

In the International Sanitary Regulations, which consolidate the provisions of various international conventions, the aim is to combine maximal protection against serious infectious diseases with minimal interference with international traffic. The regulations apply to some 160 countries, in some cases with reservations. The latest revised version of the regulations includes annotations and annexes showing how the regulations apply to, and are modified by, individual countries.[1] The volume should be most valuable to sea and air port health officers.

Parliament

National Care of the Aged

Mr. LESLIE THOMAS, on Nov. 29, in opening a debate based on the Ministry of Health's recent survey of services available to the sick and elderly, described the care of the aged as a continuing and ever-growing problem to which, in his view, domiciliary care might well prove to be the key. Of these services one of the most important was the home help service, and Mr. Thomas would like to see it include a small payment whereby neighbours and others, perhaps active retired people, could be encouraged to give occasional help to the elderly. He also wondered whether the Minister had considered the possibility of a mobile geriatric unit. The first requisite of a properly planned service was accurate information and he suggested that the Ministry of Pensions should supply the names of those who retired to their local medical officer of health so that he could compile a register of the elderly. The National Assistance Board might also send M.O.H.s names and details of those in need, for unhappily poverty was one of the main causes of the problem.

Dr. DONALD JOHNSON suggested that one of the uncomfortable facts about this uncomfortable problem was that too many old people, for want of anything to do with them, were being certified and sent to hospitals. The fundamental cause of this evil was the division of powers between the local authorities and the hospitals.

Mr. R. J. MELLISH thought that within their limits the local authorities did a magnificent job, and it was their job, for by and large the day of the voluntary worker had passed. We should not get work for the old people done on a continuing basis unless we paid for it. The whole project needed to be nationally controlled. Local authorities could not do it properly in the piecemeal way it was being tackled at the moment. They needed more powers and more money.

Mr. SOMERVILLE HASTINGS pointed out the difficulty of classifying old people as patients. They did not remain static. Some old people who had been living alone recovered unexpectedly after a few weeks in a home; others in hostels fell sick. In his view we should never get the service we wanted for them until we had a unified health service which included the welfare service as well.

Mr. MAURICE ORBACH reminded members that we had had the courage to approach nationally the problem of our children's health. It would be to our lasting discredit if we refused to acknowledge the challenge of the hopeless old men and the lonely old women whose wretchedness was the shame of our society. Like other speakers who had mentioned such things as chiropody services, he wanted to see more preventive geriatrics. He suggested that every local authority should set up an old people's health clinic. Besides a chiropody service it could offer advice on diet and general health, information about laundry, meals on wheels, and other services available.

Mr. NORMAN DODDS returned to the question of wrongful certification of old people. In their evidence to the Royal Commission, the Society of Medical Officers of Health, he declared, had said that 80% of people over sixty-five should never have been certified.

Mr. DEREK WALKER-SMITH admitted that it would have been agreeable to him as Minister of Health to be able to say that in services so deserving and necessary as health we could proceed regardless of cost, but this would be unrealistic, untrue, and indeed unhelpful. The resources which we could devote to health and welfare were necessarily not unlimited, and that made it more important that we should seek to get the best deployment of our resources. It was with this object that the Ministry had undertaken the survey of the services available to the chronic sick. Two fundamental points emerged from it: first, more effective liaison was required between the various agencies providing the services; secondly, the key to problems stemming from an ageing population lay with the preventive and home services, for the extension of communal accommodation could never of itself be enough. Turning to the home services, he said that voluntary work constituted a significant and effective contribution. At the end of last year there were 1280 old people's welfare committees in England and Wales. He agreed that we could not rely exclusively on voluntary workers, but we should recognise the great contribution which they were making. There was more work than could be done even if more voluntary workers came forward, and he had therefore asked local authorities to consider whether the time was not now ripe for renewed contact between themselves and the voluntary bodies in their areas, to encourage further voluntary help. Local authorities' services were growing. For instance, the number of home nurses had increased from 7750 in 1948 to 10,100 in 1956, the number of patients attended was 865,000 in 1949 and just under 1,100,000 in 1956, and in that year nearly 25 million visits were made by home nurses of which about half were to patients of sixty-five and over. At the end of 1948 there were just under 11,400 home helps; at the end of last year there were just over 39,000, but that was still not enough and there were recruiting difficulties. Only a few local authorities had chiropody schemes and, frankly, the difficulty about expanding this service was money. This bar applied to some extent also to the local authorities' wide permissive powers for care and aftercare.

This was not the occasion to discuss mental health, but Mr. Walker-Smith felt that he could not allow to pass uncorrected the suggestion that 80% of old people in mental hospitals should not have been certified. A survey made in 1954 suggested that there were some 10,000 old people in mental hospitals capable of being treated elsewhere. The total number of people over sixty-five in mental hospitals was about 45,000 which gave a very different percentage.

Our resources were not unlimited, but it was wrong to suppose that all progress was a matter of money. The survey had shown that much could be done within our existing resources by coordinating action and linking resources to needs. Our services for the health and welfare of the elderly and chronic sick had a great fund of good will and constructive energy, and he was confident that, with the effective employment and deployment of these, good progress could be made within our national capacity.

Opticians Bill

The main purpose of this Private Member's Bill, which is to receive a second reading on Dec. 6, is to provide a recognised status for ophthalmic opticians and dispensing opticians, to regulate their professional conduct, and to set up a General Optical Council. It is proposed that the Council should consist of 23 members, of whom 7 will be elected representatives of opticians. 6 members will be nominated by examining bodies; 5 will be doctors (3 nominated by the Faculty of Ophthalmologists and 2 by the Privy Council); 4 other members (including the chairman) will be nominated by the Privy Council and 1 member by the Governor of Northern Ireland. The Council will keep registers of ophthalmic opticians and of dispensing opticians (and similar lists of bodies corporate) and will have powers to remove and restore names. It will also be responsible for approving training institutions and qualifications for admission to the registers.

The Bill has been criticised by the British Medical Association and the Faculty of Ophthalmologists[1] which point out that it differs materially from the unanimous recommendations of the Crook Committee of 1952, on which

1. World Health Organisation: International Sanitary Regulations. 1957. Obtainable from H.M. Stationary Office, P.O. Box 569, London, S.E.1. Pp. 129, 5s.

1. *The Times*, Nov. 30, 1957.

opticians and the medical profession were represented. The National Ophthalmic Treatment Board [2] are also disturbed by the Bill's disregard of the Crook report and uneasy that the definition of the functions of different kinds of opticians is not included in the Bill itself but left to the discretion of a General Optical Council on which the medical profession is "quite inadequately represented."

The Association of Dispensing Opticians,[3] while welcoming registration, also oppose the Bill because it does not follow the Crook report. For instance, they point out, the Bill does not prohibit the sale of spectacles and sight-testing by unregistered people.

QUESTION TIME

Hereditary Changes

Mr. ROY MASON asked the Minister of Health, as representing the Lord President of the Council, for what reason it was necessary for the Medical Research Council to form a research team to watch the hereditary changes in the country's population; and which area was to be the subject of their study.—Mr. WALKER-SMITH replied: The Medical Research Council has, for a number of years, taken an active part in developing research in genetics. As part of this general policy it has decided to establish a research unit to study population genetics; the location in which the unit will work is still under discussion.

Mass Radiography of Prisoners

Mrs. JEGER asked the Home Secretary what arrangements were made for mass chest radiography of prisoners both on reception and during their sentences; and what was the policy of his department regarding treatment.—Mr. R. A. BUTLER replied: All prisoners are medically examined on reception and any prisoner suspected of having active tuberculosis (whether on reception or at a later date) is sent for an X-ray examination. The mass radiography units of the regional hospital boards are invited to visit prisons when in the neighbourhood, and in 1956 some 7000 prisoners were examined in this way. Any prisoner found to be suffering from tuberculosis or any other disease is given the treatment he requires, either in prison or in an outside hospital, usually in consultation with a local chest physician.

Discharge of Untreated Sewage

Mr. N. N. DODDS asked the Minister of Housing and Local Government, in view of the danger to health arising from the contamination of the sea and rivers where bathing took place by the discharge of untreated sewage, what consideration was being given to the matter with the object of producing a national programme to deal with the menace.—Mr. J. R. BEVINS, parliamentary secretary to the Ministry, replied: It is for the local authorities concerned to provide a remedy where these problems exist locally. While the Minister is sure that they are well aware of their responsibilities, and while he cannot be taken as accepting all the implications in the question, he is keeping in close touch with the position.

Mr. DODDS: Does not the Minister appreciate that in view of the evidence available it is about time the Government took some notice of this matter and got rid of the patchwork conditions? Will he not consider making it essential that regular samples of sea-water are taken, analysed, and the results translated into laymen's language and placed beside the sunshine and rainfall records on the promenades of our seaside resorts so that people can know something about them?—Mr. BEVINS: It is very easy to exaggerate the dangers to health that exist, but I should like to emphasise that the present restrictions on capital expenditure do not apply where there is evidence of injury to health.

Water Supplies and Radioactive Waste

Dr. EDITH SUMMERSKILL asked the Minister of Housing and Local Government what action was proposed in order to protect water supplies from possible contamination by radio substances from atomic power stations.—Mr. HENRY BROOKE replied: None of the nuclear power stations so far approved will drain to a source of drinking-water. Moreover, no significant discharge of radioactive waste is expected from these power stations. Arrangements already made with the Minister of Power will ensure that any discharge there may be does not exceed a prescribed level of radioactivity.

2. *ibid.* Dec. 2, 1957.
3. *Observer*, Dec. 1, 1957.

In England Now

A Running Commentary by Peripatetic Correspondents

ALL summer long the bulldozers have snarled in the river-bed, the drag-lines have spewed gravel into dumper trucks, a white ribbon of concrete has been spun across from the mill to the churchyard wall. Our new weir is finished. Very lovely it looks, too, with its faultless curtain of shimmering silver: so different from the rotting timbers and incontinent spurts of the old one. The floods of last winter crashed ruthlessly through the ancient foundations, and now the new weir challenges Nature for the convenience of man. For the fish-pass has been forgotten.

The wild running plumes through the gaps in the old weir were tunnels of hope for the strength of a lashing tail. The best of the salmon and sea trout got through to the spawning grounds above the town. The new silver curtain might well be of iron. A leap from the shallows, fall back on the stones: a driving urge to return to fry haunts, the heavy drag of ripe eggs. Whether to battle on or wait for a flood: whether to keep faith with forebears or to found a new dynasty elsewhere. Life must go on.

So in the little side streams below the town, history is being made this month. Bustling swirls in the shallow reaches mark the critical search for new redds. Not too strong a current or the eggs will get washed away: not too quiet a spot or they will get silted up. Gravel of just the right size, with a nice aerated flow through the stones. A dozen vigorous upward flicks of the tail to suck the top stones off, a gentle reverse to try the hollow for size; a few more structural titivations, and then the male can be called in for his quivering courtship. The economy of effort in using the top stones of the next redd to cover the eggs of the first: the male's casual careless swallow of any bouncing eggs. A line of clean yellow gravel circles shine like a chain of hope from the darker algæ of the bed. The future of the nineteen-sixties is assured.

It has been said that if we do not solve our own human problems the insects will inherit the earth. Sometimes it looks as though we shall take the whole of the terrestrial animals with us into oblivion. Perhaps the waters may do better next time with their evolution.

* * * *

There are more hazards in getting to the Medical Exhibition than the car-parking. My senior technician, eager for new laboratory gadgets, approached from St. James's Park Station. Not knowing the way, she was attempting to orientate herself with the aid of the map, when a stranger approached and asked if he could help. On learning she wanted the Horticultural Hall * his face lit up and he offered to escort her. He went every year, he explained, wouldn't miss it for the world. This year he couldn't remember if it was in the new or old hall, but as they approached and he saw "Medical Exhibition" posted outside the new hall he decided it must be the old. "No," said my technician as they reached the steps, "this is the right place for me, I'm going to the Medical Exhibition." "What," exclaimed the stranger, "aren't you coming to the Cat Show?"

* * *

If it is instructive and beneficial for a doctor to be a patient, it is all this and more also for one to be at the receiving-end of a hypodermic needle in a strange land. Certainly the late Field-Marshal Suvorov ("The ball is a fool, the bayonet a hero") whose stamping-ground this once was, would have approved of the number and magnitude of our injections.

Every four hours we rolled over and coyly unveiled the superior buttock, which before injection was swabbed with what felt like liquid air. Thereafter the techniques were strikingly individualistic.

Nurse Anna was clearly descended from Horatius, who "thrice and four times tugged amain, ere he wrenched out the steel". (Historians will recall that there had been a difference of opinion regarding the right of way over a bridge.) Nurse Thamar, a methodical little person,

* Our peripatetic correspondent of Nov. 30 apologises for having mixed his cultures.

always took a sighting shot, the patient's yelp being followed by her exasperated cluck when, as usual, she scored only an outer. Our bearded male nurse, Caravanovitch—that's what it sounded like—apparently confused the whole affair with a Magyar tentpegging contest, and galloped about, brandishing his syringe with excited cries. His momentum was so great that when on one occasion he tripped over a mat he inadvertently injected the patient in the next bed but two.

But the event of the week was Sister's round. She was obviously the Biggest Sister of the Little Sisters of the Revolution, being an immense woman who opened the glass ampoules by biting the tops off. Having parked her discus in the front hall, she came along to us for a little javelin practice, using a needle five times as big as anybody else's. "Clothed in white samite, mystic, wonderful," she began by pouring meths. over the entire trolley and then setting fire to it. This established a cosy and culinary atmosphere. Given some Tokay and gipsy violinists, we might all have been in old Buda-Pest preparing schashliks—with us as schashliks.

* * *

Just as Mr. Baldwin was always happy among pigs, so I am among cows and beasts. What a difference there is between European and African cows! No cow in Kenya ever has a calf before she is 4 years old (compared with 2–3 years here) and a bullock matures at 5 instead of 3. Yet puberty among humans is not delayed.

The African cow, the zebu, can withstand the Equatorial heat. She has an enormous dewlap and brisket and a hump, all of which help to lower the temperature, and her skin is thrice as thick as that of English cows. Although resistant to infections, she gives only about 800 gallons a year, and half of that goes to the calf. She will not let man milk a drop unless the calf is suckling. The herdsman usually milks the hindquarters while the calf sucks at the front. If the calf dies, its skin is stuffed and the effigy stands beside the deceived mother.

The best European cows for the Kenya climate are of the Channel Island type, as one would expect because their milk has a high content of solids. The Indian cows, the *sawhiwal*, are also good, and, like the Channel Island ones, will produce 800 gallons a year.

I spent an interesting morning at a demonstration farm in the heart of the Kikuyu territory, which runs courses attended earnestly by Africans. Its chief function is to teach animal husbandry based on better feeding and controlled grazing of grass. Before the emergency, many Africans had perhaps eight separate holdings, each far apart and perhaps no bigger than $^1/_8$ acre. Now these have been consolidated, and every African is given a single plot, equal or greater than his aliquot parts.

The Kikuyu live mostly on maize, tapioca, millet, and a little meat, either goat or beef. The Masai, on the other hand, still keep to the traditional diet of blood and milk, with a little mutton but no bread, and they are as fearless as ever. One of my friends has a Masai herdsman who is responsible for 200 cattle. Although the herdsman cannot count, he always knows if an animal is missing, for he can call each one by name and it will come to him. He would tackle a lion if necessary.

* * *

I had read in the Sunday papers that schoolmasters were perturbed that parents allowed their children to smoke excessively, but the thought made little impact on me until Gordon was admitted to our ward. Gordon was just 13 and small for his years; and when I read in his history, "Smoked 15/day for 3 years," I just concluded that our overworked house-physician had confused his patients. However, a glance at Gordon's heavily stained fingers dispelled my doubts and Gordon himself confirmed the statement, showing a healthy scorn for my interest in the matter. I risked further scorn by asking for details of how a schoolboy found time to fit so much smoking into the day. It seems that smoking was not allowed at school, but there was no difficulty getting a few cigarettes out of the way before school in the morning, two or three at lunchtime, and the rest in the evening. As I had to give up my pipe for economic reasons, I was interested in the financing of these operations; so on I went. "What does your Dad do?" "Mends shoes." "Who does he work for?" "Works for Mum." "And who pays for your cigarettes?" "No-one; Mum rolls them for me."

Letters to the Editor

TRAINING MEDICAL STUDENTS IN PSYCHOTHERAPY

SIR,—Dr. Balint's paper (Nov. 23) is most welcome to those of us concerned with undergraduate psychiatric education. His proposals, based upon highly successful experience with general practitioners, call for serious attention, for it is in the sphere of practical instruction in psychodynamics that the doctor of tomorrow is as yet ill-equipped.

I agree that more curricular time must be found; that some form of selection is desirable; and that the aim should be the training of the future general practitioner. But there are immense problems facing those who plan such a course as he describes. There is the novelty of the scheme, the resistances and anxieties on the part of students and staff, and the crucial problem of the teacher himself. Dr. Balint rightly indicates that only psychoanalysts with the right flair could do the job properly. They would presumably undertake not only case conferences and lectures but also supervision of individual students taking cases in therapy—an intensive programme requiring a high staff-student ratio. But where are these teachers to be found? There have been few who have been prepared to contribute their invaluable skills either to the mental health service as a whole or to academic psychiatry in particular. There is only one training school for psychoanalysis in the country, and only the merest trickle of those trained venture out of their private consulting-rooms in London. It is regrettable that psychoanalysts who, like Dr. Balint, are giving the benefit of their experience to their medical colleagues are so rarely found.

Is it not now the occasion for psychoanalysts in this country—as in the United States—to align themselves more with their academic and medical colleagues, to take appointments in the hospital service and in the universities so that Dr. Balint's proposals may be implemented?

This may well be the time, for it has recently been recommended by the General Medical Council that teaching schools should adopt a bolder and more experimental attitude to medical education. Here is the opportunity for worth-while experiment—provided we have the right men to do it.

Department of Mental Health, University of Aberdeen. W. M. MILLAR.

SIR,—I agree in principle that training medical students in psychotherapy is a laudable aim, and welcome Dr. Balint's article as a valid criticism of yet another defect in the training of potential doctors.

It seems to me, though, that he has made a fundamental error in wanting to equate surgery with psychotherapy. Most surgeons would regard operative technique as but a part of surgery; I regard psychotherapy as only part, albeit an important one, of psychiatry as a whole. Had he made his demand for more extensive a training in psychiatry, I should have agreed with him. His aim is to show at least some students a new perspective so that when they qualify they may become more effective and better doctors. This will not, I feel, be achieved if their basic training in psychiatry is ignored and their outlook focused mainly on their own weaknesses and shortcomings and how these affect the doctor-patient relationship.

Dr. Balint is an iconoclast and seeks to destroy not only old idols like Kraepelin but also the fundamental body of knowledge which constitutes clinical psychiatry. His criticism of modern textbooks is partially justified, but not to the extent that we can throw them out of the window. In my view the one thing we must teach the undergraduate is how to take a complete psychiatric

history, how to make a thorough mental examination and to become familiar with and able to recognise the commoner psychiatric conditions; having done this, by all means let us teach the fundamentals of psychotherapy. Some patients do have a defect in the sensorium which may well influence the doctor-patient relationship and is often missed if the student is not trained to look for it.

Whatever Dr. Balint thinks of psychiatric syndromes, I continue to believe that there is such a thing as psychiatric diagnosis and classification. If we teach the student that he can ignore the principles of examination, investigation, and diagnosis, and to focus his attention more or less entirely on problems of interpersonal relationship, he will likely become the sort of doctor who will miss an obvious involutional melancholia which may well benefit from what Dr. Balint refers to as "a series of shocks."

The fundamental principle of medical education is to assure that the intelligent student is given a properly balanced diet of digestible teaching, so that he can examine different views and disciplines with a critical eye. If we overemphasise one aspect and exclude others, the inexperienced student easily becomes skewed in his thinking about psychiatric problems. Psychiatric educators are understandably anxious to remove the "blinkers" from their students, but before doing so they have a duty to examine their own blind spots. My own view is that psychotherapy is best left for postgraduate teaching to the mature and seasoned practitioner. Nevertheless, in view of the lamentably short time devoted to psychiatric teaching of the undergraduate, the experiment Dr. Balint suggests is to be welcomed.

Uffculme Clinic,
Moseley, Birmingham. J. A. HARRINGTON.

SIR,—Dr. Balint, in his interesting article of Nov. 23, does less than justice to the teaching hospitals when he says that the kind of knowledge which he advocates is *not* what is being taught in these hospitals: and that what is taught is not the psychiatry that the future doctor will need in his everyday practice.

In at least some of the teaching hospitals the teaching of psychiatry is designed to give the students the knowledge and skills which they will need in ordinary, everyday practice, and indeed much *is* being done in student education on lines which, I feel sure, Dr. Balint would approve.

If he will make some inquiry into what is happening nowadays in the teaching hospitals, I think he will agree that he is being unfair and mistaken in his rather dogmatic criticisms of what undergraduate teachers arrange for their students.

London, W.1. J. D. W. PEARCE.

ATHEROSCLEROSIS: POSSIBLE ILL-EFFECTS OF THE USE OF HIGHLY UNSATURATED FATS

SIR,—Dr. Harman (Nov. 30) mentions the "increasing interest in the clinical use of such unsaturated acids as linoleic acid to lower serum-cholesterol levels, and thus presumably to slow down the rate of progression of atherosclerosis"; and he suggests their use "may lead to side-effects that would outweigh any benefit they have in atherosclerosis" since the peroxides formed from such fats are toxic. Some of us have tried to point out in your columns (e.g., in a letter last year [1]) and elsewhere the importance of tocopherols (vitamin E) in protecting essential fatty acids in foodstuffs, in the gut and in the body. It is fortunate that the distribution of linoleic acid and of tocopherols runs roughly parallel in vegetable seed oils in their natural state, and therefore if those that are rich in it (such as safflower, cottonseed, or corn oil) are used as a source the tocopherols will also be obtained. The distribution of tocopherols in corn oil seems to be particularly favourable since about 89% is γ-tocopherol and most of the remainder is the α form; the former is the more powerful antioxidant and therefore the better protects linoleic acid from oxidation in the air or in the gut, but it is hardly absorbed from the gut, unlike α-tocopherol.

In general therefore we shall obtain sufficient tocopherols to prevent any unfortunate side-effects from oxidation of linoleic acid if we include in our diet certain unprocessed vegetable seed oils. There is a variety of ways in which this can be achieved.

1. *Lancet*, 1956, i, 381.

Oxford. H. M. SINCLAIR.

VALUE OF AEROSOL TRYPSIN

SIR,—We are grateful to Dr. Palmer for reminding your readers (Nov. 30) that 'Alevaire,' sodium bicarbonate, saline, or water in doses of 15 ml. by aerosol will all reduce the viscosity of sputum by the same amount after an hour's administration (presumably by virtue of their water content).

It is also very valuable to note in the same issue that Dr. Agerholm has found alevaire combined with sublingual isoprenaline to be effective for the ordinary post-coryzal cough.

But as we have shown (Oct. 26), for bronchitic atelectasis in the respiratory cripple, aerosol trypsin is a sputum liquefier of an entirely different order.

Respirator Research Unit,
The Institute of Orthopædics,
Royal National Orthopædic
Hospital, Stanmore, Middlesex. A. B. KINNIER WILSON
F. HARWOOD STEVENSON.

FULMINATING INFLUENZA

SIR,—Dr. Sheldon in his letter of Nov. 23 is less than fair in his views on operative treatment of fulminating influenza. He mentions seeing a bronchoscopy performed on a patient with this condition. I had the opportunity of watching the treatment, progress, and recovery of this patient; I am surprised that he did not think it important to say that the patient had made a good recovery.

I was present when three of the bronchoscopies and the tracheotomy were performed on the patient and the first two bronchoscopies I saw were definitely lifesaving procedures. The patient was extremely ill, with increasing dyspnœa and cyanosis. At bronchoscopy were found large pieces of fibrinous exudate and blood-clot, lodging in the trachea and main bronchi—some were too large to pass through the bronchoscope and had to be removed by holding the mass with forceps at the end of the bronchoscope and bringing them all out of the trachea together.

The relief to the patient's breathing after these fibrinous masses had been removed was most striking; he was able to breathe with much less effort and the cyanosis disappeared. He was then about to rest and sleep.

I think there can be no argument about the fact that dyspnœa and cyanosis are dangerous to a normal person. To a person suffering from a severe illness with pyrexia and toxæmia, the strain of respiratory distress and hypoxia can be rapidly fatal—a point which is well shown in Dr. Roberts' article of Nov. 9.

In the case of this patient, the only way of relieving the dyspnœa and cyanosis was to remove the material which was causing the obstruction; it was too solid and tenacious to be coughed up by the patient, and, as far as I know, there is no other way of removing it except by bronchoscopy. Naturally such a procedure in an extremely ill patient calls for a skilled operator.

I think there is little doubt that, during the recent epidemic of influenza, patients died who might have been saved by therapeutic bronchoscopy to remove the foreign material from the main air-passages.

There are two main reasons for performing a tracheotomy in this condition. Firstly, it is, I think, a now well-established principle, particularly in thoracic surgical centres, that patients suffering from any form of respiratory distress are considerably benefited by tracheotomy, thus ensuring a perfect airway and reducing the dead space. Secondly, it enables tracheobronchial toilet to be carried out efficiently and easily. In spite of Dr. Roberts' conclusion (4), even if suction cannot clean out

the smaller air-passages and spaces in the lungs, it definitely helps the patient to have the larger air-passages kept clear of secretions and debris. A further reason for performing a tracheotomy in these cases is one that was well shown in the patient mentioned above—namely, laryngeal œdema and obstruction due to encrustation on the vocal cords of inspissated purulent material from the lungs.

In this country there are now many skilled bronchoscopists capable of dealing with this type of case, and I hope that they will be asked to help in the treatment of this condition, rather than waiting for the patient to become black with tracheal obstruction, and then performing an emergency tracheotomy—by when it will be too late. The material causing the obstruction cannot be sucked out through the tracheotomy tube; it is too solid and tenacious and needs to be removed by forceps under direct vision.

I hope I have shown that bronchoscopy and tracheotomy are extremely important therapeutic procedures in fulminating influenza where there is dyspnœa and cyanosis due to obstruction of the trachea and main bronchi by masses of fibrinous exudate and blood-clot. In fact without them the patient will certainly die, the cause of death being respiratory obstruction superimposed on toxæmia.

Birmingham. G. A. RAWLINS.

INFLUENZAL PNEUMONIA TREATED WITH CORTISONE AND ANTIBIOTICS

SIR,—I have followed this correspondence with great interest. I must say that I agree with Dr. Gunn's scepticism (Nov. 16) as to the value of cortisone. Contrariwise, I was surprised to see Dr. Breen (Nov. 16) advocate its employment on the hit-or-miss principle. Nevertheless, there is, as he says, much to learn from a study of the effects of cortisone on immunity. W. C. Boyd[1] has, to my mind, summarised the present position admirably as follows:

(1) Cortisone usually *depresses* resistance, whether innate or acquired, of laboratory animals to a wide variety of infectious agents.

(2) Pathogens are often induced to multiply more extensively and local inflammatory processes are diminished.

(3) The effectiveness of antibiotics is generally reduced.

(4) Antibody production or release is not increased.

If these statements are correct, then its indications in the acute infections are few and far between. In fact, the only rational indication for its use is as substitution therapy in those patients whose adrenals have been more or less destroyed by operation, injury, or disease. In infections therefore, the only valid indications are:

(1) Addison's disease where the organs have been *slowly* destroyed by a *chronic* caseating process—tuberculosis.

(2) Waterhouse–Friderichsen syndrome, where they have been *rapidly* destroyed by hæmorrhage as in an *acute* fulminating meningococcal infection. As far as I am aware, there is no evidence that the adrenals are grossly impaired in any other infection, and thus when it is used for other infections it is entirely on empirical grounds. As for the so-called collagen diseases, here we have a double paradox in that their cause and the effect of cortisone on them are both unknown!

Dr. Rose (Nov. 2) asked whether cortisone has any action on the heart. Surely the answer must be None. It is not a cardiac stimulant and its administration must be as empiric and useless as that of strychnine when it was employed to "support" the failing diphtheritic heart. Acute circulatory failure consequent upon the loss of adrenal function by whatever cause is a simple question of substitution therapy, but even here we should remember that there are other adrenal cortical steroids such as aldosterone and medullary substances (e.g., noradrenaline) whose actions we are only beginning to uncover.

Failure in the presence of intact adrenals is a complicated phenomenon, which, as far as I am aware, has not been fully elucidated. The use of cortisone in its management cannot be defended on any but empirical grounds. Cope[2] has epitomised the matter in his advice: (1) Be cautious in deciding to give cortisone and have a good reason; (2) strive to ensure correct diagnosis first; (3) watch for true criteria of improvement (many conditions are self-limited—e.g., glandular fever).

Ilford Isolation Hospital, Romford, Essex. I. M. LIBRACH.

"MUNCHAUSEN'S SYNDROME"

SIR,—Dr. Bass and Dr. Selson (Nov. 30) had better think again and a little more deeply about malingering.

A person who pretends to be ill, and who obtains no objective gain by so pretending, is very ill indeed, However much we may dislike trying to help such "miserable psychopaths" and however intractable we may find their condition to be, I suggest that we have some obligation to consider, dispassionately whether we can help them or not.

Shenley Hospital, near St. Albans, Herts. D. BARDON.

COMBINED BARIUM MEAL AND CHOLECYSTOGRAPHY

SIR,—One of the most accurate of radiographic examinations is oral cholecystography, but in common with other methods of investigation, it is not only what you do but the way that you do it that means so much.

I introduced the combined method of barium meal and oral cholecystography, as described by Professor Johnstone and Dr. Sumerling (Nov. 30), into the Wanstead Hospital some six years ago, but I have long since ceased to encourage it simply because it is both inaccurate and incomplete as far as the gall-bladder is concerned.

For accurate cholecystography, films of the finest possible detail are required and to achieve this the use of a good Potter-Bucky diaphragm and accurate coning are vital. Using the standard type of explorator fitted with a thin movable grid, no-one can pretend that the quality of the radiographs is nearly good enough in most cases.

It is claimed that one of the advantages of the method is that all gall-bladders are radiographed in the erect position. It was my impression that a film in the erect position was a standard feature in all cholecystographies.

Most radiologists will agree that the normal minimum should be a plain film of the gall-bladder area, films taken some 10–12 hours after ingestion of the contrast medium in the prone and erect positions and a final film after a fatty meal.

In my experience the radiograph of the contracted gall-bladder after the fatty meal can be the most important of the whole series. At this stage, calculi which have hitherto been obscured by the contrast medium are often brought to light. Using the combined method the gall-bladder is too frequently obscured by barium.

The method is valuable enough in the positive cases, but what about the great number of negative cases. Can the authors report with confidence that these are normal gall-bladders? I find the technique so unconvincing that now when I am asked to use it I can rarely report more than that the gall-bladder is concentrating normally and contracting well. This is hardly the criterion of the normal since so many gall-bladders containing calculi behave in this way.

My results are generally similar to those described. In many instances non-functioning gall-bladders have been discovered but in these cases I always repeat the cholecystography and often enough the repeat has proved to be normal.

If an investigation is worth doing, it is worth doing well. The method described cannot be regarded as an adequate investigation of the gall-bladder within the limits of our knowledge. To advocate it in order to economise in radiation is no argument in its favour. Too many pathological gall-bladders will be missed if too much reliance is placed

1. Boyd, W. C., *in* Fundamentals of Immunity, p. 30. London, 1956.

2. Cope, C. L., *Practitioner*, 1955, **175**, 545.

on the results. Our function as radiologists is to try to make a diagnosis using the most accurate methods available.

London, W.1. M. I. ROBINSON.

EARLY ADMISSION TO HOSPITAL OF MENTALLY DEFECTIVE BABIES

SIR,—My attention has been drawn to a letter in your issue of Nov. 30 over the signature of E. W. Shepherd.

In the fifth paragraph of that letter there appears a categorical statement that the poverty of recruitment to the medical staff of mental-deficiency hospitals is evidenced by the existence on the staffs of those hospitals of what your correspondent describes as "an undue proportion of relatively aged, poorly qualified doctors, and many establishments are bolstered by numbers of locum tenentes."

You will probably agree that a sweeping denunciation of that kind should not be allowed to pass without investigation as to its validity. In all probability the writer would not have written as he did without first taking care to provide himself with adequate national statistics to justify this statement. It is very unfortunate that he does not furnish the necessary evidence in his letter. Perhaps it was overlong and therefore had to be excluded.

Dr. Shepherd is invited, in the interests of the public and in the interests of those members of our profession who work in mental-deficiency hospitals in this country, to provide the evidence on which he rests a statement that can only be described as detrimental to the honour and interests of the practitioners and staff of those special hospitals. If that evidence is forthcoming and well founded, then steps will have to be taken both by the public and by the profession to remedy this grievous state of affairs.

Wallingford, Berks. E. J. WARBURTON.

SIR,—Two statements in Dr. Leys' otherwise excellent letter of Nov. 23 call for comment. When he writes that "the only doctors in a position to do this [compare the abnormal with the normal] are general practitioners and pædiatricians" he is perhaps unduly critical of the medical staff of institutions for mental defect. They too have comparative standards and are well aware of the stages of normal development. It is also difficult to agree that in mongolism one can "state with certainty the ultimate limits of mental capacity." While the majority are of idiot or imbecile grade some attain the feeble-minded level; and lately the case of a mongol of normal intelligence has been described.

It is generally accepted that the number of cases in which a definite diagnosis of defect can be made at, or soon after, birth is relatively small, and is confined to those with gross neurological or developmental abnormalities, to mongols, and to a few other uncommon clinical types such as microcephalics and gargoyles. In such cases the problem of determining the best age at which the child should be admitted to an institution can be difficult.

Sometimes medical advisers and others recommend immediate separation from home and can adduce reasons for this recommendation.

They fear that the parents may become unusually attached to the child and that when the time for separation comes, as almost inevitably it must, the break will cause an undue emotional upset and upheaval. Equally they say that the presence of an idiot child may have an adverse effect and instil bad habits into the other members of the family. All of us have seen families whose whole life seems to revolve round the care of the defective in their midst. The parents cannot go for outings and holidays together; they spend time and money seeking medical and other opinions on treatment, often to the detriment of their normal offspring; and to his siblings he represents a skeleton in the family cupboard, so that they are reluctant to bring their friends and sweethearts home.

But other considerations must be borne in mind. Parents in this unfortunate position are often burdened by a sense of shame, and subconsciously consider themselves responsible that the poor child is handicapped as he is. Sometimes a feeling of guilt is added. The child may have been unwanted, unsuccessful contraception or abortion may have been attempted, or the parent may feel that some imaginary weakness in himself may have caused the condition. If the child enters an institution immediately the fear that they have abandoned it, and neglected their obligations, adds further anxiety to their guilt and shame.

It is better that the parents absolve themselves of these ideas by devoting themselves to the child for a time at least. In this way they can rid themselves of their feelings of unworthiness, and when the child does leave their care are satisfied that they have done their duty and can accept the parting with equanimity. In any case even a normal child is faulty in habits and has to be fed and attended to in every way during his first year, and so their hardship during the period they look after their offspring is not unduly great.

A good home atmosphere has advantages over the best-run institution, and for this reason, as well as for its beneficial effect on the parent, immediate or premature admission is not advocated, and it is considered that a delay of up to two years is advisable. Conscientious and wise parents can generally be prepared to accept this proposition if it is tactfully explained to them. For those prepared to continue home care for a longer period help and encouragement may be necessary and should be provided.

The Royal Institution, Starcross, Devon. D. PRENTICE.

P.A.S. AND THE PATIENT

SIR,—Dr. Simon's letter of Nov. 9 on the stains on laundered underclothing following P.A.S. therapy leads me to draw attention to a similar but more spectacular reaction with various lavatory cleaning agents, the results of which may closely simulate the passage of frank blood.

Department of Social Medicine, University of Birmingham. J. H. EDWARDS.

OVER THE HILLS FROM WINDSCALE

SIR,—As medical officer of health of the largest concentration of population in the area "contaminated" by the recent accident at Windscale, I may be permitted to make some observations.

Press, radio, and television were all informing the public, and area agencies for milk distribution reassuring us, that we would have alternative supplies of milk readily available following the ban on local milk, but many households in the town received no milk until late afternoon on the first day of the ban, which again reminds us that rapid administrative reorganisation of vital food supplies takes time and becomes more difficult with increasing sizes of towns affected.

To me the incident raises much more important issues of contamination which take place around us every day, and about which many public-health officers are silent.

We contaminate our air with the products of combustion and "dump" our sewage in the sea despite the fact that more and more proof comes every day of the danger of these to our health.

Yet when the Atomic Energy Authority have taken all the precautions they can foresee before building their plant in the area—e.g., choosing the site carefully, investigating the currents in the Irish Sea to determine drift of radioactive waste, fitting filters to chimney stacks, and being controlled by legislation concerning radioactive contamination—there is criticism from some of the way they handled the incident.

The Atomic Energy Authority's staff were doing a fine service to the community in dealing with this emergency and I received all the information I asked for from them.

They were much too busy to advise every departmental head of each local authority affected, but their information, "when sought," was helpful, concise, and most practical.

In every new and vital industry there will always be developmental difficulties, but when reasonable precautions have been taken, public-health officers should be tolerant when things go wrong. Let them keep hazards in mind, but in perspective, and not forget about those that are still present, but unfortunately no longer dramatic or modern.

Health Department, Barrow in Furness. I. D. M. NELSON, Medical Officer of Health.

PENICILLIN HYPERSENSITIVITY

SIR,—Your leading article of Nov. 9, stressing the frequency and possible severity of penicillin hypersensitivity, was a timely reminder of its potential dangers. Nevertheless too great a stress on this aspect might unnecessarily deprive many patients of treatment which could be lifesaving.

In fact it is our experience, and that of others, that penicillin hypersensitivity is often transient. Many patients with a highly suggestive history of hypersensitivity may show no reaction when tested or retreated. Moreover in those still sensitive desensitisation is usually much easier than in the case, for instance, of streptomycin. In view of the potential dangers it is unwise to give a large test dose. If the previous reaction has been mild it is sufficient to give an initial dose of 100 units intramuscularly though in fact we have usually given 1000 units without trouble. If there is no reaction the dose can be rapidly increased.

It must be remembered that the patient may be hypersensitive to either procaine or crystalline penicillin, though there is probably some cross-reaction between them. It may be, though we have not seen this personally, that occasionally desensitisation is not permanent: it is perhaps wise, if a further course of penicillin is required in a previously desensitised patient, to begin with a small dose. We have personal experience of only one patient with a severe anaphylactic reaction. Desensitisation proved perfectly simple.

Southfield Hospital, Edinburgh. JOHN CROFTON ARNOLD PINES.

TREATMENT OF UNDESCENDED TESTIS

SIR,—Your leading article of Nov. 16 needs, I think, some supplementary comments. This question of the right treatment of the undescended testis is important, knowledge of the subject is slight, and many conclusions have been based on too weak or directly misleading premises.

For example, the work you mention by Hansen [1] does not permit any broader conclusions about the right treatment of undescended testis. The material is very unhomogeneous: it was collected from many municipal hospitals, the patients were operated on by many different surgeons, and the patient's age at operation varied from infancy to prepuberty. Of course such material can be judged as a whole, but even when it has been handled as well as in this case it does not prove anything about the result of the operation for undescended testis as a whole, and no conclusions can be drawn from it about the right indications and the right age for operation.

You say: "Those who choose to postpone surgical treatment till puberty cannot be accused of neglecting their patients' interests." There is a danger in not defining the diagnosis of undescended testis before discussing the subject, and that is why so many discussions about this subject are completely sterile. At least with two groups—undescended testis with complicated hernia and ectopic testis—we should be very cautious about judging the fate of the unoperated testis. In infancy and early childhood one meets quite a number of untreated cases in these groups where the testis has suffered irreversible damage because of its abnormal position (torsion, trauma, and stasis). In these cases at least there is good reason for early operation, the results are good, and non-surgical treatment with a truss is directly contraindicated.

With the other types of undescended testis it is too early to judge the best age for operation. As far as I know no material yet exists which can conclusively indicate the right approach to this very important clinical subject.

1. Hansen, T. S. *Acta chir. scand.* 1946, **94**, 117.

Pædiatric Surgical Department, Rigshospitalet, Copenhagen. C. C. WINKEL SMITH.

SIR,—For Mr. Scorer (Nov. 30) and others interested in this problem, the East Anglian branch of the Society of Medical Officers of Health has now completed its survey of the incidence of undescended testicles amongst children attending local-authority schools in six areas in East Anglia and hopes shortly to publish its results, which are based on the examination of 21,981 boys in the age-groups 5, 8, 11, and school-leaving age.

P. A. TYSER for East Anglian Branch, Society of Medical Officers of Health. Cambridge.

PNEUMOCONIOTIC NEUROSIS

SIR,—Dr. Macdonald (Sept. 28, Oct. 19, and Nov. 23) Dr. Holt (Oct. 12), and Dr. Grunwald (Oct. 26) have shown interest and concern in the problem of applying the provisions of the Industrial Injuries Act to pneumoconiosis. A letter is an inappropriate place to discuss in detail an important and difficult problem, but as the authors of the report quoted by Dr. Grunwald we think he oversimplifies the position by suggesting that the Industrial Injuries Act should be amended on the basis of the one extract he quotes from the report.

One of the important reasons why such a simple amendment is not possible is that its introduction would contravene a principle on which past and present Acts are based. It is a requirement that the claimant's injury or bodily damage if proven shall be attributable to the occupation in the individual case "with reasonable certainty." Several committees—Samuel (Cmd. 3495), Dale (Cmd. 7557), Beney (Cmd. 9548)—set up to investigate compensation for industrial injury, have all recommended that this principle should be adhered to and they have emphasised that the high prevalence of disease or disability in a particular occupation is not in itself enough to support claims for compensation. We also said (M.R.C. Report no. 290, p. 149); "The variations in breathlessness may be due to the effects of pneumoconiosis on lung function, or they may be due to various degrees of non-industrial lung or heart disease, and it is impossible to distinguish the two." Dr. Dunner and Dr. Hardy (Nov. 23) give us no clue as to how to separate bronchitis and emphysema resulting, they think, from industrial dust exposure from that caused perhaps by heavy smoking and repeated respiratory infections or other causes.

While this requirement of attribution with reasonable certainty in an individual case remains an essential criterion for meeting claims for industrial injuries, it will not be possible to make the Act cover those who are disabled from common diseases such as bronchitis, emphysema, or rheumatism, even if it can be shown that the prevalence of the conditions is high in particular occupations.

Two courses are possible. The first is to abandon the rigid attribution requirement and, in occupations where epidemiological studies have shown an increase in the

prevalence of the common diseases, to compensate any disabled man as if all his disability was due to this occupation. This would remove the injustices which your correspondents claim to exist, but only at the expense of introducing new ones. With the growth of epidemiological research, more and more differences from occupation to occupation in the incidence of the common diseases will be discovered until, after an interval during which compensation will depend perhaps more on the order in which investigations are carried out than on the actual hazard of the occupation, the only uncompensated disabled will be those in small or ill-defined occupational groups!

The second requires a fundamental change in approach—namely, to make provision under the National Health Insurance Scheme for adequate benefits for the disabled irrespective of how the disablement has been caused. If this were done, epidemiological studies could return to their primary objective—prevention.

We agree with Dr. Macdonald (Nov. 23) that the time has come for a further review of the position to see whether it is possible to achieve any better compromise than the present one.

J. C. GILSON
P. D. OLDHAM
F. MEADE.
Pneumoconiosis Research Unit, Llandough Hospital, Penarth, Glamorgan.

PHILIP HUGH-JONES.
Postgraduate Medical School, London, W.12.

CLASSIFICATION OF DISEASES IN GENERAL PRACTICE

SIR,—With the publication of a new edition of the *Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death*,[1] may I suggest to those general practitioners who are considering recording the cases in their practices that this volume forms an excellent basis for such a record. Using a four-hundred-sheet 5 in. × 8 in. loose-leaf book and the three-digit categories I have found this system quite adequate.

E. W. BEDFORD-TURNER.
Polegate, Sussex.

TREATMENT OF THYROTOXICOSIS WITH POTASSIUM PERCHLORATE

SIR,—We were pleased to see the article by Professor Smellie in your issue of Nov. 23 on the treatment of juvenile thyrotoxicosis with potassium perchlorate. Since the publication of our article in 1954 [2] we have continued to use this drug in the treatment of adult thyrotoxicosis, with satisfactory results. No untoward effects, other than two skin rashes, have been noted; and the two apparent instances of gastric irritation proved, on further investigation,[3] to have been no more than coincidental. We should, however, like to take this opportunity of confessing that the initial adult dose recommended by us (400 mg. daily) has subsequently proved to be too low, and this no doubt accounts for the rather slow response noted in some of our early cases. We now begin treatment with 1600 mg. daily, given in four separate doses. The dose is subsequently lowered according to the patient's progress to a minimum of 200 mg. daily. It would appear from Professor Smellie's results that the dosage levels effective in children are a great deal lower.

It should also be emphasised that we use potassium perchlorate for long-term medical treatment only. It is not a satisfactory drug for preoperative preparation, since the antithyroid effect is lost immediately iodides are given, as Professor Smellie points out.

M. E. MORGANS
W. R. TROTTER.
University College Hospital Medical School, London, W.C.1.

1. See *Lancet*, Nov. 2, 1957, p. 882.
2. Morgans, M. E., Trotter, W. R. *ibid.* 1954, i, 749.
3. Morgans, M. E., Trotter, W. R. *ibid.* p. 883.

TOO MANY DOCTORS?

SIR,—It is to be hoped that the findings of the Willink Committee will not be accepted by the medical schools. We still live in a free and competitive country and it is no part of the duty of a university or school to refuse to educate all those they can accommodate on the grounds that some may not find safe jobs.

Are we to assume that all those trained at British medical schools are to be employed in the National Health Service? Many of them may wish to lead a fuller or more adventurous life. They may wish to be private practitioners, or missionaries in China, or to take up practice in India or Malaya.

Are we so satisfied with medicine that we are content to think that it will be the same in twenty years' time? By that time we may really have a National *Health* Service in place of the present National Sickness Service. We should need many more doctors if we had an adequate system of medical examinations to maintain the nation in health. It may even be the case that the people of this country will follow the lead of others in deciding that health is worth paying for. In that case thousands of private practitioners would be employed in carrying out routine comprehensive examinations to detect early signs of disease.

These are just one or two random possibilities which may prove the planners wrong. Planners may be very sane people who always keep their hair on, but they don't always keep the roofs on.

KENNETH C. HUTCHIN.
Hatfield, Herts.

ELECTROENCEPHALOGRAPHIC STUDY OF SYNCOPE

SIR,—May I take advantage of your correspondence columns to express some criticisms of the article by Professor Gastaut and Dr. Fischer-Williams in your issue of Nov. 23?

They say that they use "syncope" to describe a loss of consciousness with or without convulsions. I infer from this that the presence or absence of convulsions is not a part of their definition of syncope, and I conclude that they use syncope to describe a loss of consciousness. Since loss of consciousness is also part of their definition of epilepsy it seems that a patient who has epilepsy also has syncope. But I suspect that cerebral anoxia is part of their definition of syncope and the absence of cerebral anoxia is part of their definition of epilepsy. No-one, I am sure, will be surprised to learn that if the heart stops beating sufficiently long the patient becomes unconscious and goes into decerebrate rigidity while his E.E.G. becomes flat. Indeed the dictionary definition of syncope given by Professor Gastaut and Dr. Fischer-Williams indicates that the condition may be fatal. They should not conclude (from the observation that a patient becomes unconscious when his heart stops beating due to compression of his eyes) that in a spontaneous loss of consciousness the heart stops beating, for if such an argument is valid they would also have to conclude that in a spontaneous loss of consciousness someone is pressing upon the patient's eyes. In other words, to show that a provoked cerebral anoxia leads to a loss of consciousness does not allow the inference that a spontaneous loss of consciousness is due to cerebral anoxia.

They state, by way of a conclusion, that the tonic anoxic seizures of syncope are not epileptic. But they defined epilepsy as a loss of consciousness with convulsions, and I do not see why they had to experiment to arrive at this conclusion, since, by definition, "no convulsions, no epilepsy."

I understand them to say that pressing on a patient's eyes is a valuable test, for if the heart slows considerably the patient is suffering from syncope. Since some of their patients with syncope had convulsions, is it to be assumed

that if the test is positive in a patient with convulsions anticonvulsant therapy should be withheld? If this is not to be assumed, what is the point of the test? Are epilepsy and syncope in fact mutually exclusive?

E.E.G. abnormalities (seizure records) which are associated with the convulsions of epilepsy are said to be absent when the patient has syncope and is not convulsed. Is this surprising? I would have been surprised if one of their patients who had loss of consciousness with convulsions, called by them syncope, did not have such abnormalities, but on this point Professor Gastaut and Dr. Fischer-Williams are silent.

Royal Infirmary, Glasgow. STEWART RENFREW.

HUNTING THE NEEDLE

SIR,—There is no need to obtain an import licence to find a needle electrically. In 1914 I was present at an operation in the war hospital at Cambridge and saw a bullet located near the spine with a make-shift apparatus whereby a current passing through two electrodes and the bullet rang a bell.

London, W.C.2. C. SUFFERN.

TRACHEOSTOMY TUBES AND CONNECTIONS

SIR,—I should like to reply to Dr. Sandiford's letter of Sept. 21. We are agreed that anoxia is to be avoided at all costs, and this was my main reason for designing the connections I described in your issue of Aug. 24.

In the case of a totally paralysed patient undergoing intermittent positive-pressure respiration (I.P.P.R.) when the cap of a Cobb's or Magill's connection is removed, most of the air escapes and pulmonary ventilation virtually ceases: this is further aggravated if a large-bore suction catheter is inserted, as it largely blocks the tracheostomy tube. Thus the patient is subjected to some degree of anoxia during suction, which is consequently hurried. With the connections I described ventilation is unaffected and suction may proceed at leisure until the tracheo-bronchial tree is cleared, with no anoxia.

The cap is improved in such a way that it does not stick (like Cobb's) and is not accidentally displaced. There is a bayonet-fitting not previously mentioned.

The tracheostomy tube is not allowed to fur: secretions do not tend to accumulate in the lumen, because it is smooth and unbroken (unlike the Smith tube[1] arrangement).

Secretions can always be removed from the tracheo-bronchial tree with a 6 E.G. catheter: if it becomes blocked with pus, the nurse, having always half a dozen sterile catheters to hand, uses another one. I do not think that the size of the tracheostomy tube has any appreciable bearing on healing. This is determined by the time the tube is in the wound.

One can avoid ulceration of the trachea (through excessive pressure from the cuff) by training nurses to use the minimum volume of air to inflate it. This volume is charted by the nurses to avoid errors.

The manometer on an I.P.P.R. apparatus does not record the *endotracheal* pressure during *expiration*. To obtain this pressure the manometer must be connected to a tube led into the trachea below the tracheostomy tube. It is not clear that Dr. Sandiford has done this. My experience is that, using Cobb's or similar connections, endotracheal pressure may take 1–3 seconds to return to zero during expiration and in I.P.P.R. may never return to zero before the next inspiratory phase. This is on account of the high resistance in right-angled connections of inadequate bore. The important thing is the *time* taken for intrathoracic pressure to reach zero, as this affects the mean intrathoracic pressure over the whole cycle. Addition of a negative phase at the machine end of the apparatus does not altogether overcome the difficulty.

Patients undergoing I.P.P.R. who become seriously ill, or who are given depressant drugs, are often unable to compensate for the physiological insult of raised intrathoracic pressure. Venous return is reduced and circulatory failure follows, the blood-pressure fluctuating during the various phases of the respiratory cycle. It is to reduce this effect to a minimum that I use connections in I.P.P.R. (and anæsthesia) which have negligible resistance to flow of air (or gases).

Chislehurst, Kent. JOHN BULLOUGH.

1. Hodges, R. J. H., Morley, R., O'Driscoll, W. B., McDonald, I. *Lancet*, 1956, i, 26.

IMPORTANCE OF THE ILEUM IN THE ABSORPTION OF VITAMIN B_{12}

SIR,—Dr. Booth and Dr. Mollin (Nov. 30) appear to have misunderstood our letter of Nov. 23. Our objection was (and is) simply to their statement (Nov. 16) that in the rat "vitamin B_{12} is *not* absorbed in the proximal small intestine." We did not suggest that this may be the main site of such absorption. So far as their original paper is concerned[1] their conclusion was that "small amounts of vitamin B_{12} may be absorbed in the upper jejunum of the rat, although the site of maximal absorption is the middle segment of the small intestine." We see from their letter of Nov. 30 that by "proximal small intestine" they mean only the upper one-fifth, but do not indicate how the middle and distal parts are apportioned.

So far as the experiments of one of us (R. H. G.) at Yale are concerned, we were of course aware that simple diffusion might play a part. However, the degree of absorption was much higher than the 1–10% suggested by Dr. Booth and Dr. Mollin—for instance, 36% when 0·0025 μg. of vitamin B_{12} was introduced into a loop made of the upper part of the small intestine. It should be noted that in this experiment the proximal part of the small intestine was a third of the total length.

Department of Medicine, University of Edinburgh. R. H. GIRDWOOD
A. DOIG.

A FUNCTIONAL NECESSITY

SIR,—While agreeing fully with your leader on the need for a new specialist grade in the hospital service, I feel that at this time, when the B.M.A. and its committees have come down so heavily in favour of one consultant grade only, continued pressure for a second grade will endanger the unity of the profession—a thing to be avoided when negotiating with a Government not fully alive to the need for a satisfactory hospital service.

I would suggest that we should compromise with our friends of the B.M.A. by proposing a grade of junior consultant allied to the present consultant grade, but starting at a lower salary, and travelling to the top salary more slowly. Thus today consultants should reach top salary between the ages of 40 and 45. The new junior consultant could arrive at the same salary between the ages of 50 and 55.

The incentive to achieve promotion would lie in the higher starting salary and the more rapid arrival at the top point on the scale. Honour will be satisfied in that we shall all be together on the same salary scale. It might also discourage a cheeseparing Government from increasing unduly the proportion of doctors in the lower section of the grade as the saving would be small. A new grade on a definitely lower scale might be too tempting to an economy-minded Minister or Chancellor.

Peace Memorial Hospital, Watford, Herts. P. W. ROE.

SIR,—Your remarks in your leader of Nov. 30 apply with particular force to the work done in the casualty departments of most peripheral hospitals. Clinical experience and judgment are of the greatest importance in this front line of the hospital service. Yet only very rarely has any consultant time to spare to supervise the work done there in person. Of necessity therefore, vital decisions must be left to often very junior doctors. The most senior post a regional hospital board will usually establish is that of a junior hospital medical officer. The

1. Booth, C. C., Chanarin, I., Anderson, B. B., Mollin, D. L. *Brit. J. Hæmat.* 1957, 3, 253.

pay of such a post is not sufficient for an experienced doctor with family responsibilities.

Each of us knows a few middle-aged doctors with wide experience and good judgment who have not been able to acquire higher qualifications but would like to work in hospitals permanently, provided they are assured of security and a reasonable income. At the present time they must drift away into jobs where their experience is useless or even become unemployed.

I therefore consider that the quality of medical care to the public could be improved by the creation of the post of a senior casualty officer at each peripheral hospital with a salary of perhaps £1500 yearly.

Leigh, Lancs. F. R. ZADIK.

HISTAMINE AND DENTAL CARIES

SIR,—Severe earache from carious lower teeth is not uncommon, and very often patients seek an otologist's advice rather than a dentist's. I have quickly relieved bad toothache in many patients (including myself) by filling a carious cavity with chlorpheniramine, an antihistaminic powder.

Histamine has not, as far as I know, been cited as a cause of dental caries, but my results suggest that this might be a fruitful hypothesis for research by dentist and pathologist.

Pisa. C. NIOSI.

FATALITY FROM THREE COMMON SURGICAL CONDITIONS IN TEACHING AND NON-TEACHING HOSPITALS

SIR,—The statistical review by Dr. Lee and his colleagues (Oct. 19) prompts me to make certain comments from the viewpoint of a registrar at a non-teaching hospital.

I was surprised to learn that the mortality-rates for the three conditions reviewed were so high, and I felt a little dubious about accepting the figures quoted. To my mind, the mortality-rate for a certain surgical condition is found by quoting the total number of patients treated and the total number who died. No "sampling" or elimination is allowable if a worthwhile estimate is to be obtained. Having kept records of the cases on which I have operated, I can quote the following mortality-rates: appendicectomies 0·56%, perforations 7%, prostatectomies 5·4%.

Overall mortality-rates will always depend on the direct personal supervision of the surgeon concerned, and it is my contention that one surgeon can only look after, with the maximum efficiency, a certain number of patients. Reliance on telephone messages from subordinates is not sufficient—it is on personal appreciation of the case at the bedside that the best decision for any particular treatment depends.

When a diagnosis of appendicitis is made, take out the appendix, no matter what the hour. Very few patients with appendicitis can safely be left for a few hours, until it is more convenient for all concerned to operate. Reliance on pulse and temperature is to be condemned—a man may have generalised peritonitis with a temperature of 98·2° and a pulse-rate of 70 a minute, and still not look ill.

Where there are a capable surgeon and adequate facilities for operation, the conservative treatment of appendicitis is not, in my view, to be recommended. If those advocates of this method of treatment were asked now they themselves would like to be treated for appendicitis, how many would truthfully choose their own method?

I regard a paramedian incision as far better than the gridiron; it is easier to make and easier to extend if required, and gives more adequate access to the other organs if the diagnosis is wrong; and one does not (or should not) get herniæ through it—this from one who has spent some hours repairing incisional herniæ through other people's "gridirons"!

The charge that one is violating "clean territory" to my mind is unacceptable. If an appendix is so securely walled off by the body as to constitute a sound barrier to organisms, then the surgeon has no right to interfere.

Not uncommonly the retromesenteric appendix is overlooked; the initial symptoms of diarrhœa and vomiting, with little or no guarding in the right iliac fossa, are too often ascribed to gastroenteritis, and it is only when the initial sealing-off process breaks down that the patient reaches hospital and quite a mess is found at operation.

I have not read in the textbooks that headache is rarely a symptom of appendicitis. Headache is very, very rare with appendicitis, and if the patient complains of headache one ought to examine the remainder of the body for the cause of the abdominal pain, and only as a last resort make a diagnosis of appendicitis.

Of perforations, I would again say "suture the hole as early as possible." Reviews of cases treated conservatively often contain an example of a "disaster"—it is fear of this possibility of an error in diagnosis which makes me decide in the vast majority of cases to operate. Most of the "perforations" I have lost have died through some other factor which would have killed them anyway—e.g., a man, aged 27 years, with two gastric ulcers, and a liver riddled with secondaries from a carcinoid tumour (unsuspected until the liver was seen at operation).

I consider that in hyperplasia of the prostate the bedside appreciation of each patient is of paramount importance. These people (I refer particularly to the patient admitted as an emergency with retention) are elderly, in a poor state of health, and poor operative risks. Adequate appreciation of the length of the history of urinary trouble, the cardiovascular system, and the blood-urea are to my mind the three essentials, plus the state of the tongue! High-powered kidney-function tests are an unnecessary discomfort and risk to the patient. Catheterisation is to be avoided, and if the patient is judged fit for operation, the prostate should be removed on the day of admission.

My preference is for a simple Freyer's enucleation as quickly and gently as possible, no tipping of the patient, closing the bladder whenever possible, relying on a gum-elastic catheter for drainage, and getting the patient back to bed and round from the anæsthetic as soon as possible, bearing in mind that moving the patient from the operating-table on to the trolley and into bed is what shakes him up as much as the operation itself.

Age is no bar to operation if other things are equal, and an optimistic outlook by the surgeon, plus real sympathy for their particular discomforts, is of more value to these elderly people than some may realise.

Weymouth and District Hospital, Dorset. JOHN M. E. JEWERS.

THE CUP THAT CHEERS

SIR,—Insomnia, often allied with "nerves" and garrulity, is among the commoner acquaintances of the general practitioner. Nine consecutive patients of mine all complaining of "causeless" insomnia, were drinking daily from 5 to 10 cups of tea (or coffee) each. The actual amount was fairly constant day by day in each person, and little or none was drunk after teatime. Four of these patients found that their insomnia ceased when they gave up tea-drinking. It is a commonplace that tea taken in the evening may cause sleeplessness, but it also appears that in some persons tea taken much earlier in the day may still be acting as a cerebral stimulant at bedtime. One wonders whether the vast national demand for barbiturates and tranquillisers does not in part arise from the national cerebral intoxication with caffeine.

Chronic hypochromic anæmia is also always with us. If ferrous gluconate is added to a cup of tea, the inky appearance proclaims the formation of ferrous tannate. Although the inky colour is abolished by acidification, the addition of alkali (to simulate conditions in the small bowel) restores it. May it not be that a large part of our iron mixtures actually arrives at the duodenal mucosa in this—presumably unassimilable—form? It is indeed rather difficult to understand how people who take tea or coffee with every meal ever absorb iron from their food at all.

Lowestoft. N. B. EASTWOOD.

MONGOLISM IN EAST ANGLIA

SIR,—In discussing the causation of mongolism Keizer[1] states "the frequency of mongolism is steadily increasing." Tredgold[2] referred to Penrose's figure of 1 per 10,000 of population in 1933, and van der Scheer's 1.6 per 10,000 in Holland in 1927.

Inquiries were made from the medical officers of health of the East Anglian region to ascertain the number of mongols known to exist in their areas and the results of the inquiry are as follows:

Area	*Population*	*Mongols*	*No. per 10,000 population*
Cambridgeshire	179,800	33	1·83
Gt. Yarmouth C.B.	51,600	20	3·88
Holland C.C.	102,600	24	2·34
Huntingdon C.C.	75,300	17	2·26
Isle of Ely C.C.	88,700	17	1·92
Ipswich C.B.	110,000	32	2·91
Norfolk C.C.	377,300	118	3·13
Norwich C.B.	121,226	17	1·40
Soke of Peterborough C.C.	65,800	12	1·82
East Suffolk C.C.	227,000	54	2·45
West Suffolk C.C.	125,100	35	2·80
	1,518,126	379	2·50

99 mongols are reported from hospitals in the region, giving a total of 478—i.e., 3·148 per 10,000 population.

It is frankly impossible to estimate the numbers who have not come to notice, since the age of reporting to local health authorities varies between areas. It may be significant that areas where there are active outpatient clinics for the diagnosis of mental deficiency show a higher rate of incidence.

The increase on Penrose's figures may be due in part to better ascertainment and partly to improved pædiatric and child-welfare services in the case of the very young and improved medical treatment in older mongols.

It seems reasonable to suggest that the incidence in this part of England is at least 3·2 per 10,000 population.

I have to thank the medical officers of health in the areas mentioned for their assistance in the survey.

Little Plumstead Hospital, Norwich. J. V. MORRIS.

"METABOLIC INSUFFICIENCY"

SIR,—To decry the diagnosis of metabolic insufficiency for the syndrome you describe in your annotation of Nov. 16 is merely to beg the whole question of the ætiology of this group of symptoms. Patients manifesting them occupy a major portion of the general practitioner's consulting time.

On far less evidence than is adduced by the proponents of the existence of "metabolic insufficiency" these patients are labelled neurotic, and with far less justification than treatment with triiodothyronine they are treated with barbiturates or other "tranquillisers". Tranquillising therapy is purely symptomatic, and the psychiatrist, while competent in dealing with the true neurotic, is wholly at a loss with this type of case.

In criticising Dr. Morton for making claims without conducting an adequately controlled trial, one should also criticise the great majority of practitioners for persistent evasion of a major clinical problem.

London, S.E.13. ALLAN CHATELIER.

CLOSING OF SMALL HOSPITALS

Dr. LESLIE HARTLEY, Glen House, Middle Gordon Road, Camberley, Surrey, writes:

"I have written an article in a lay newspaper entitled Requiem for a Hospital which is on the subject of the closing of smaller general hospitals and cottage hospitals. If any doctor is worried about the future of his own small hospital, and would care to read my article, I shall be very pleased to forward it to him."

1. Keizer, D. P. R. *Lancet*, Aug. 17, 1957, p. 344.
2. Tredgold, R. F., Soddy, K. Text Book of Mental Deficiency. London, 1957.

Medicine and the Law

Inquiry into Competence of Anæsthetist

AFTER comments had been made by the coroner at an inquest on a patient who died in Whipps Cross Hospital,[1] it was decided to set up a committee to inquire into the professional competence of a senior hospital medical officer anæsthetist at the hospital. This committee, which was predominantly professional, met on Oct. 25 and its deliberations involved consideration of the death of the patient in question and also of four other deaths to which the coroner had referred. The anæsthetist attended the meeting, and the committee also heard evidence by the consultant orthopædic surgeon who was to have performed the operation on the patient, the consultant pathologist who conducted the postmortem examination, and members of the medical staff of the hospital.

The committee's findings draw attention to the fact that the five deaths to which the coroner referred covered a period of seventeen years, that during this period and for many years before the anæsthetist had administered up to 1000 anæsthetics a year at the hospital, and that of the five cases at least two of the deaths had nothing to do with anæsthesia. Of the remaining cases, the committee considered that after the lapse of so long a time little would be gained by investigating two of them, and they therefore concentrated their inquiry on the most recent one. After careful consideration of all the evidence, the committee reached the following unanimous conclusions:

(*a*) That the evidence did not show that the patient's death was directly due to the negligence or incompetence of the anæsthetist.

(*b*) That, bearing in mind his grading in the service, he was competent in the simpler techniques of anæsthesia but he had not taken steps to bring his knowledge of the newer processes up to date, and that in consequence arrangements should be made for him to undertake a course of at least six months' duration.

(*c*) That in view of his apparent incompatibility with some of the senior medical staff at Whipps Cross Hospital it would be desirable in his own interest, after the completion of the course referred to, that he should take up duty at some other hospital.

The North East Metropolitan Regional Hospital Board has accepted the committee's findings.

Obituary

WILLIAM EWART GLADSTONE DUTHIE
M.A., M.B. Aberd., D.P.H.

Dr. Ewart Duthie died at his home at Johannesburg on Nov. 15 at the age of 87. He was born in Aberdeenshire and he was educated at the University of Aberdeen, graduating M.A. in 1890 and M.B. in 1894. He took the D.P.H. in 1896. After holding a house-appointment at the City Hospital, Aberdeen, he settled in South Africa shortly before the Anglo-Boer War. During the war he served as railway medical officer to the Imperial Forces. Later, after holding appointments as railway medical officer at Trompsburg and Edenburg in the Orange Free State, he settled in Kroonstad, where he was railway medical officer, district surgeon, and medical officer of health.

In 1925 he came to Johannesburg and practised in the southern suburbs and in Orange Grove. In 1936 ill health forced him to give up practice. In his retirement he devoted himself largely to gardening and racing, of which he was a keen follower.

Dr. Duthie was twice married, and leaves a widow. His younger son died in 1955 and he is survived by his elder son, Dr. Comyn Duthie.

1. See *Lancet*, Sept. 21, 1957, p. 593.

Notes and News

THE 1952 OLYMPICS

AT the 15th Olympic Games in Helsinki in 1952, a detailed study of human performance was undertaken from the viewpoints of technical athleticism, physiology, physical education, social medicine, and statistics.[1] The investigation was organised by Dr. E. Jokl, in his youth an athlete of Olympic class, now professor of physical medicine in the University of Kentucky, and one of the leading authorities on violent exercise and competitive athletics. He was assisted by members of the Finnish Institute of Occupational Health.

The ages of the 4925 competitors ranged from 13–14 to 45 in women and to 66 in men. Perhaps the most striking feature about the ages was the early maturity of swimmers, especially girls. In running, the average age progressively increased with distances above 1500 metres. In such contests as fencing and gymnastics, experience was clearly of paramount importance; and experience came with age.

Most athletes came from the cooler parts of the world, but the appearance of a few outstanding performers from the hot zones shows that adaptation to even the hottest environment can be perfect enough for successful athletic training and competition. Some of the world's best runners came from Jamaica, and the winners of the field-hockey tournament were Indians. Countries with high infant-mortality rates fared badly in the Games, but those with low birth-rates did not necessarily do poorly. The best-nourished nations could afford to send the greatest number of representatives to the Games, and among individual participants those from the best-fed countries were the most successful. The average daily consumption of food per head by competitors at Helsinki yielded about 4500 calories. Meat was highly favoured, but little fish was eaten. There was a demand for milk, butter, raw vegetables, and fruit, and for sugar generally. No strong alcohol was taken.

Though clearly decreasing throughout the world, traditional misconceptions about physical ability and various prejudices still stand in the way of some women competitors. But though the history of women's athletics is short, there is already enough evidence to show that biologically the female is more robust and more capable of adapting herself to the demands of environmental challenges than has for so long been assumed. For example, at the Olympic Games in 1896, the 100 metres (for men) was won in 12 sec.; the girl who took the 100 metres gold medal at Helsinki was 0·5 sec. faster. The women's high-jump record is now only about 1 in. lower than that of the best man in 1906. A Danish girl has swum 500 metres 7 sec. faster than the time accomplished by the great Johnny Weissmüller at his zenith some thirty years ago. Many of the best Olympic women athletes were over 35; and at least 2 were grandmothers. It was found that in women athletes in general, skeletal measurements of the pelvis were normal. Fertility-rates and deliveries had also been normal. No evidence was found of any pelvic or cardiovascular strain, and a number of records were established during menstruation—an observation confirmed during the Melbourne Games last year.

The Finnish Association of Sports Physicians also recorded that no instance of damage to health was identified in any competitor in the whole of the Games despite the severest physical exertion.

ANTICANCEROUS ANTIBIOTICS

FOR twenty-five years, investigations into the biotherapy of cancer have been pursued in Moscow. Starting from the work of Coley, Professor Klueva and Professor Roskin [2] have tested products derived from a large number of infective agents for antiblastomic activity—polysaccharides of *Chromobacterium prodigiosum* and other gram-negative bacteria, diphtheria toxin, *Bacillus subtilis*, *Escherichia coli*, bacteriophage, viruses, funguses and moulds, malaria parasites, entamœbæ, leishmania, therapeutic antibiotics, and "schizotrypanum" (an extract of *Trypanosoma cruzi*, the causative agent of Chagas' disease). The trypanosoma extract was found to have the greatest antiblastomic powers.

In animal experiments, schizotrypanum has been found to retard the growth of malignant tumours (Brown-Pearse carcinomas in rabbits and spontaneous carcinoma in white mice). In tumours from treated animals, the cells were necrotic, mitosis was decreased, and there was increased host-resistance as judged by infiltration with lymphocytes and fibroblasts. In tissue-culture experiments, similar results were obtained.

In clinical trials, regression or disappearance was observed in a few malignant tumours of the lips, vocal cords, throat, breast, œsophagus, intestine, and skin. Professor Klueva and Professor Roskin conclude that such "antibiotics" as schizotrypanum have great potentialities in the treatment and control of malignant tumours; and they point out that the prevalence of cancer is low in regions of Chile where Chagas' disease is common.

It is hard to assess these findings, which are based on work and ideas that are largely unfamiliar in this country; but the interesting record which Professor Klueva and Professor Roskin have provided gives workers in other countries an opportunity to see whether their own investigations make contact at any point with what has been done in Russia.

1. Jokl, E., Karvonen, M. J., Kihlberg, J., Koskela, A., Noro, L. Sports in the Cultural Pattern of the World: a study of the 1952 Olympic Games at Helsinki. Institute of Occupational Health, Helsinki, 1956. Pp. 116. 1500 Finnish marks.
2. The Regression of Malignant Tumours under the Influence of Products of Microbial Metabolism. Prof. N. G. Klueva, Prof. G. K. Roskin. From the Government-Controlled Institute of Albumins and Vaccines. Moscow, 1957.

University of Oxford

On Nov. 23 the degree of D.M. was conferred on R. A. M. Oliver.

University of Cambridge

Dr. P. J. Lachmann has been awarded the John Lucas Walker studentship for original research in pathology.

Royal College of Surgeons of England

On Wednesday, Dec. 11, at 2.30 P.M. at the college, Lincoln's Inn Fields, London, W.C.2, Sir Russell Brock will deliver the Bradshaw lecture. His subject is to be the present position of cardiac surgery.

Association of Surgeons of Great Britain and Ireland

The annual meeting of this association will be held in Belfast on Thursday, Friday, and Saturday, April 10, 11, and 12, 1958.

Royal Appointment

Air Vice-Marshal James Hill has been appointed honorary physician to the Queen in succession to Air Vice-Marshal F. E. Lipscomb, who has retired from the Royal Air Force.

Middlesex County Medical Society

At a meeting of this society at 6.30 P.M. on Monday, Dec. 16, at the Middlesex Guildhall, Westminster, S.W.1, Dr. C. A. Birch will give his presidential address. He is to speak on the history of the medical society.

Royal Society

At the anniversary meeting of this society on Nov. 30, Sir Cyril Hinshelwood was re-elected president. Elections of medical fellows included Sir Lindor Brown as biological secretary and Brigadier J. S. K. Boyd and Sir Charles Dodds as members of the council.

Association of Industrial Medical Officers

At the annual general meeting on Nov. 8 Dr. W. E. Chiesman was appointed president, Dr. R. A. Gordon Smith hon. secretary, and Dr. P. A. B. Raffle hon. treasurer. The association's office is now at 47, Lincoln's Inn Fields, London, W.C.2.

Birmingham Regional Hospital Board

Dr. C. W. Gordon has been appointed senior administrative medical officer of the board in succession to Dr. S. J. Scurlock, who has retired.

Dr. Gordon, who is 45, graduated M.B. from the University of Aberdeen in 1938. During the late war he served in Persia, India, and Egypt where he was D.A.D.M.S. in the Cairo area. He was demobilised in 1945 with the rank of lieut.-colonel. The following year with a Rockefeller scholarship he visited the United States, where he held a post as resident at the Johns Hopkins School of Hygiene. In 1948 he was awarded the DR. PUBL. HLTH of Johns Hopkins University for a thesis on health organisation in urban communities. On his return to this country he became assistant medical superintendent of Aberdeen Royal Infirmary before he joined the staff of the Birmingham R.H.B. in 1948. He was appointed deputy S.A.M.O. two years later. He is a member of the advisory panel of the Nuffield Provincial Hospitals Trust's investigation into the functions and design of hospitals. He is a part-time lecturer in the department of medical statistics in the University of Birmingham, and from 1949 to 1952 he lectured on hospital administration at the London School of Hygiene and Tropical Medicine.

Dr. J. N. Morris is visiting professor of epidemiology at Yale University School of Medicine till the spring.

Appointments

BADENOCH, ELEANOR, M.D. Glasg., D.P.H. : assistant M.O. (maternity and child welfare), Dundee.
DISON, GERALD, L.R.C.P.E., D.OBST., D.P.H. : M.O.H., Nuneaton, Bedworth, and Atherstone.
HOWELLS, D. MARJORYE G., M.R.C.S. : assistant M.O.H. and school M.O., Plymouth.
KINNEAR, PETER, M.B. St. And., F.R.C.S.E. : S.H.M.O., artificial limb and appliance centres in Aberdeen and Inverness, and surgical units of the Aberdeen General Hospitals Board.
REYNOLDS, G. M., M.B. Wales, D.P.H. : deputy M.O.H. and deputy principal school M.O., Norwich.
SANDOR, F. F., M.D. Budapest, F.R.C.S.E. : senior casualty officer, Hartlepools group of hospitals.
WADE, C. C., M.B. St. And. : assistant M.O. (health and welfare), Dundee.

Birmingham Regional Hospital Board:

ADAM, J., M.B. Glasg. : assistant psychiatrist (S.H.M.O.), St. Edward's Hospital, Cheddleton.
FLANAGAN, H. M., L.R.C.P.I., D.P.M. : consultant psychiatrist, St. George's Hospital, Stafford.
GALLA, THOMAS, M.B. Edin., D.P.M. : consultant psychiatrist, St. Edward's Hospital, Cheddleton
ROBINSON, A. W., M.D. Cantab., D.M.R.D. : consultant radiologist, Birmingham (Dudley Road) group of hospitals.
SIMPSON, J. H., M.D. Cantab., M.R.C.P. : consultant physician (geriatrics), Stoke-on-Trent group of hospitals.

Manchester Regional Hospital Board.

GANGULI, P. K., M.B. Calcutta, D.M.R.D., D.M.R.T. : part-time consultant radiologist, Burnley and district hospitals
PATERSON, ISABELLA R., M.R.C.S., D.A. : part-time assistant anæsthetist (S.H.M.O.), Barrow and Furness Hospitals.
SMITH, STANLEY, M.D. Leeds, M.R.C.P., D.P.M. : part-time consultant psychiatrist and medical superintendent, Lancaster Moor Hospital.

Colonial Appointments :

COOPER, W. G., M.D. Lpool, D.T.M. & H. : M.O., Jamaica.
DOBSON, T. B., L.R.C.P.I. : M.O., British Guiana.
EDMUNDSON, KENNETH, M.B. Lpool : D.M.S., Seychelles.
GALEA, F. W., M.D. : M.O., Northern Nigeria.
HOLLAND, JEAN T., M.B. Glasg. : pathologist, Uganda.
HOLLITSCHER, GERTRUD, M.D. Vienna : M.O., British Guiana.
MACKENZIE, S. M., M.B. Aberd. : M.O., Uganda.
O'SHAUGHNESSY, J. D., M.B. Dubl. : M.O., Sarawak.
PHILPOTT, P., M.B. : M.O., Uganda.
PURDY, BRIAN, M.B. Birm. : M.O., North Borneo.
ROY, S. K. N., L.R.C.P.I. : M.O., Mauritius.
TA-MIN, S. F., L.A.H. Dubl. : M.O., Mauritius.

Births, Marriages, and Deaths

BIRTHS

FLECK.—On Nov. 14, at Mount Pleasant Hospital, Swansea, to Joy, wife of Douglas G. Fleck, M.B., DIP. BACT., a daughter (Julie Anita), a sister for Suzanne Lesley.

*WILKINSON.—On Nov. 5, to Clodagh (formerly Boyd, of Cape Town), wife of Dr. J. B. Wilkinson, of 20, Drury Lane, Lincoln—a daughter.

* Amended notice.

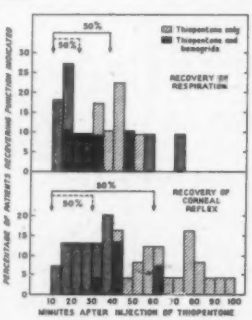
CORRIGENDA

Citric Acid and Urolithiasis.—The report by E. E. Gordon and S. G. Sheps to which we referred in this annotation (Sept. 28) appeared in *New Engl. J. Med.* 1957, **256**, 1215.

Combined Barium Meal and Cholecystography.—In fig. 7 of last week's article by Professor Johnstone and Dr. Sumerling we mistakenly reversed the male columns in the 30–39 and 40–49 age-groups. The height of the male column should have increased progressively with age.

Poliomyelitis Vaccination.—On Nov. 23 (p. 1062) we said that vaccine would be available for children born in 1957 "who are under 6 months old." This should have read "who have reached the age of 6 months."

Use of Bemegride in Terminating Barbiturate Anæsthesia.—In the article by Dr. Wyke and Dr. Frayworth (Nov. 23) we unfortunately introduced errors in fig. 2 (p. 1026). The right-hand arrow of the unbroken line in the top half of the diagram was wrongly placed; and cross-hatched blocks (thiopentone only) should have been superimposed in certain places on the stippled blocks (thiopentone and bemegride). The accompanying figure shows the correct version.



Diary of the Week

DEC. 8 TO 14

Monday, 9th

UNIVERSITY COLLEGE, Gower Street, W.C.1
5 P.M. Dr. Harry Harris : Human Biochemical Genetic (Last of three lectures.)
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
4.30 P.M. (Queen Charlotte's Hospital, Goldhawk Road, W.6.) Sir Arthur Gemmell : Phæochromocytoma Complicating Pregnancy.

Tuesday, 10th

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
5 P.M. Dr. Terence East : Aspects of the History of Cardiology—Lessons of the Deadhouse. (First of two FitzPatrick lectures).
ROYAL SOCIETY OF MEDICINE, Wimpole Street, W.1
5.30 P.M. *Experimental Medicine and Therapeutics.* Dr. J. N. Hunt, Dr. E. N. Rowlands, Dr. Michael Atkinson, Dr. D. A. W. Edwards, Mr. A. J. Honor, Dr. N. F. Coghill : Gastric Function.
8 P.M. *Psychiatry.* Dr. John Lorber : Follow-up of Children with Tuberculous Meningitis with Special Reference to Psychiatric and Neurological Aspects.
ST. MARY'S HOSPITAL MEDICAL SCHOOL, W.2
5 P.M. Mr. A. W. Bourne : Uterine Inertia in Labour.
WEST END HOSPITAL FOR NEUROLOGY AND NEUROSURGERY, 91, Dean Street, W.1
5.30 P.M. Mr. L. C. Oliver : Post-traumatic Space-occupying Lesions.
INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. Brian Russell : Pyogenic Infections of Skin.
INSTITUTE OF NEUROLOGY, National Hospital, Queen Square, W.C.1
5.30 P.M. Prof. A. Asenjo (Chile) : Classification of the Surgical Vascular Diseases of the Brain.
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
4.30 P.M. (Chelsea Hospital for Women, Dovehouse Street, S.W.3.) Mr. W. Hawkesworth : Utero-vaginal Prolapse.
ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Prof. M. L. Rosenheim : Sensitivity Reaction to Drugs.
CHELSEA CLINICAL SOCIETY
8.30 P.M. (Rembrandt Hotel, Thurloe Place, S.W.7.) Mr. William Redpath : Skeletal Finds at St. Bride's Church, Fleet Street.
MANCHESTER MEDICAL SOCIETY
5 P.M. (Clinical Sciences Building, York Place, Manchester, 13.) *Surgery.* Mr. Selwyn Taylor : The Solitary Thyroid Nodule.

Wednesday, 11th

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
2.30 P.M. Sir Russell Brock : The Present Position of Cardiac Surgery. (Bradshaw lecture.)
ROYAL SOCIETY OF MEDICINE
4.30 P.M. *Physical Medicine.* Dr. B. G. B. Christie, Dr. Hugh Burt : Non-Articular Rheumatism.
POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
11.45 A.M. Prof. K. Brechner-Mortensen (Denmark) : Gout.
2 P.M. Dr. Harry Harris : Biochemical Genetics.
INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Dr. J. Clifford Hoyle : Natural History of Pulmonary Sarcoidosis.
INSTITUTE OF NEUROLOGY
5.30 P.M. Dr. John Marshall : Disorders of Muscle.
ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, W.1
3.30 P.M. Dr. Henry Yellowlees : Causes of Juvenile Delinquency.
EUGENICS SOCIETY
5.30 P.M. (Burlington House, Piccadilly, W.1.) Dr. J. S. Weiner : Settlement of Europeans in Extreme Climates.
MANCHESTER MEDICAL SOCIETY
4.30 P.M. *Pathology.* Prof. H. B. Maitland : How Do Viruses Grow?
NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY, 64, St. James's Street
8.30 P.M. Lady Barnett : Psychological Aspects of Television.
ROYAL COLLEGE OF SURGEONS OF EDINBURGH, Edinburgh, 8.
3.30 P.M. Dr. Cuthbert Dukes : Precancerous Conditions of the Colon and Rectum.

Thursday, 12th

ROYAL COLLEGE OF PHYSICIANS OF LONDON
5 P.M. Dr. East : Aspects of the History of Cardiology—Heart-failure and Treatment. (Second of two FitzPatrick lectures.)
ROYAL SOCIETY OF MEDICINE
5 P.M. *Ophthalmology.* Mr. P. D. Trevor-Roper : Influence of Eye Disease on Pictorial Art.
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
12 NOON (Queen Charlotte's Hospital.) Prof. W. C. W. Nixon : Modern Views on Disordered Uterine Action.
ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 26, Portland Place, W.1
7.30 P.M. Dr. J. F. B. Edeson : Experimental Transmission of *Wuchereria malayi* from Man to Various Animals in Malaya.
ALFRED ADLER MEDICAL SOCIETY
8 P.M. (11, Chandos Street, W.1.) Dr. T. M. Ling : Emotional Effects of Illness.
HONYMAN GILLESPIE LECTURE
5 P.M. (University New Buildings, Teviot Place, Edinburgh.) Mr. G. L. Alexander : Foramen Magnum and High Cervical Syndromes.
UNIVERSITY OF ST. ANDREWS
5 P.M. (Queen's College, Dundee.) Prof. F. G. Young : Aspects of the Endocrine Control of Growth.

Friday, 13th

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
3.30 P.M. Mr. William McKenzie : Surgical Treatment of Deafness.
5.30 P.M. Mr. Kenneth Rotter : Tumours of the Nose.

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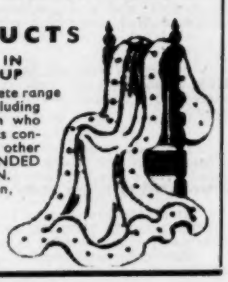

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Academic and Educational

EXAMINING BOARD IN ENGLAND
by the
ROYAL COLLEGE OF PHYSICIANS OF LONDON
and the
ROYAL COLLEGE OF SURGEONS OF ENGLAND

Notice is hereby given that the following Examinations will commence on the dates stated below:

DIPLOMA IN INDUSTRIAL HEALTH
9th January
DIPLOMA IN OPHTHALMOLOGY
5th February
DIPLOMA IN PHYSICAL MEDICINE
13th February
DIPLOMA IN MEDICAL RADIO-DIAGNOSIS
Part I—13th February
DIPLOMA IN MEDICAL RADIOTHERAPY
Part I—13th February
DIPLOMA IN TROPICAL MEDICINE AND HYGIENE
19th February

Applications and fees for either or both Parts of an Examination must reach the Secretary, Examination Hall, Queen-square, London, W.C.1, at least 21 days before Part I of the Examination begins. FRANCIS M. STENT, Secretary.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

COURSE IN CLINICAL SURGERY
FEBRUARY–APRIL, 1958

A 2 months' Full-time Course in Clinical Surgery will be held from 18TH FEBRUARY to 12TH APRIL, 1958.

The number of candidates accepted for the course will be limited to 15, and the closing date for entries is Friday, 20th December, 1957.

Fees: £31 10s. plus £6 5s. for the course of 24 surgery lectures given at the College.

Further information of, and applications for this course may be obtained from Mr. W. F. DAVIS, Deputy Secretary, Royal College of Surgeons, Lincoln's Inn-fields, London, W.C.2. Tel.: HOLborn 3474.

UNIVERSITY OF LONDON
BRITISH POSTGRADUATE MEDICAL FEDERATION
INSTITUTE OF NEUROLOGY
(Queen-square)

PRELIMINARY NOTICE

A COURSE OF LECTURES on "The Neurological Aspects of General Medical Conditions" will be given on MONDAYS from 6TH JANUARY to 17TH MARCH, 1958, at 5.30 P.M., at The National Hospital, Queen-square, London, W.C.1.

Fee for the full course will be £3 3s., single lectures 7s. 6d.

Details of the programme will be announced later.

UNIVERSITY OF LONDON
INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
(Incorporating the teaching facilities of Queen Charlotte's Maternity Hospital, Chelsea Hospital for Women, and the Department of Obstetrics and Gynæcology at Hammersmith Hospital)

Applications are invited from graduates with a registrable qualification for enrolment for the SPRING TERM (3RD MARCH to 31ST MAY, 1958). Graduates attend each of the constituent hospitals in turn for clinical work, and attend lectures and special demonstrations at all 3 hospitals. Enrolment fee £3. Tuition fee £36 a term.

General practitioners wishing further experience in obstetrics may be accepted to attend the course at Queen Charlotte's Maternity Hospital for shorter periods—i.e., 2–4 weeks. They will have the opportunity of attending the labour ward in addition to combined classes of lectures and demonstrations at the 3 hospitals of the Institute. Ministry of Health grants are payable to approved general practitioners attending for a period of 1 or 2 weeks.

An INTENSIVE COURSE for those preparing for M.D. and M.R.C.O.G. will be held from 2ND JUNE to 14TH JUNE, 1958.

During the winter vacation, a limited number of graduates may attend the practice of the Hospital.

Hostel accommodation is available at Queen Charlotte's Hospital and at Hammersmith Hospital.

Further particulars can be obtained from the Secretary, Institute of Obstetrics and Gynæcology, Chelsea Hospital for Women, Dovehouse-street, London, S.W.3.

THE NUFFIELD FOUNDATION
NUFFIELD INSTITUTE FOR MEDICAL RESEARCH

RESEARCH FELLOWSHIPS

The Nuffield Foundation, as an experiment, is prepared to offer 1 Research Fellowship annually in each of the 3 years 1958, 1959, and 1960, tenable at the Nuffield Institute for Medical Research at Oxford, to enable a suitably qualified person who intends to follow an academic career in obstetrics or pædiatrics in the United Kingdom to concentrate for a year on animal experiments directly related to basic physiology or pharmacology in the fœtus or the newborn.

Each fellowship will be tenable for 1 year and is limited to graduate of medicine of a University within the British Commonwealth. Normally a candidate should have completed an appointment as Registrar (or its equivalent) in an approved department of obstetrics or pædiatrics, and also have obtained the higher qualification appropriate to his chosen specialty. The stipend will be within the approved range of salaries for Senior Registrars under the National Health Service.

Applications for the award beginning in 1958 must be received before 15th February, 1958, by the Director, The Nuffield Foundation, Nuffield Lodge, Regent's Park, N.W.1, from whom full particulars and application forms can be obtained.

L. FARRER-BROWN, Director of the Nuffield Foundation.

THE NUFFIELD FOUNDATION

DENTAL FELLOWSHIPS AND SCHOLARSHIPS

The Nuffield Foundation invites applications, from citizens of the United Kingdom, for Fellowships and Scholarships in Dentistry. To help the advancement of teaching and research in the United Kingdom on dental health and disease, the Foundation is prepared to award a number of Fellowships:

(i) to enable selected men and women with dental qualifications to receive such additional training in pure and applied science as is desirable to fit them for an academic career in dentistry (but not to obtain a medical qualification), and

(ii) to enable selected university graduates in medicine and science to receive training that will qualify them to undertake teaching and fundamental research on dental health and disease.

The Foundation is also prepared to award a limited number of Scholarships to assist students of outstanding ability attending a university dental school to devote 1 or 2 years to further studies of the basic sciences.

All applications must first be endorsed by the executive authority of the appropriate dental or medical school or scientific faculty of a university in the United Kingdom. They must be received by the Foundation by 1st March in the case of Fellowships which are awarded once a year; and by 31st January and 30th June in the case of scholarships which are awarded twice a year. Copies of the conditions of both Fellowships and Scholarships and the application forms are obtainable from the Director, The Nuffield Foundation, Nuffield Lodge, Regent's Park, London, N.W.1.

L. FARRER-BROWN, Director of the Nuffield Foundation.

UNIVERSITY OF OXFORD

RADCLIFFE TRAVELLING FELLOWSHIP, 1958

AN EXAMINATION for a Fellowship of the annual value of £600, tenable for 2 years, will be held at Oxford on 15TH FEBRUARY, 1958. Candidates must have passed all the examinations for the Degree of Bachelor of Arts and Bachelor of Medicine, and must not have exceeded 4 years (exclusive of national service) from the time of passing the last examination for the Degree of Bachelor of Medicine.

The examination will take the form of a self-chosen essay and an interview. Further particulars to be obtained from the Regius Professor of Medicine, 13, Norham-gardens, Oxford.

All applications, with essays, must be sent to the Regius Professor of Medicine, 13, Norham-gardens, Oxford, by 31st January, 1958.

THE HEBERDEN SOCIETY

ON FRIDAY, 13TH DECEMBER, 1957, at 5 P.M., Dr. K. BRØCHNER-MORTENSEN will deliver the Heberden Oration for 1957 at The Wellcome Foundation, Euston-road, London, entitled "Gout."

Members of the medical profession are cordially invited to attend.

ANÆSTHETICS COURSE

A 2 weeks' COURSE OF LECTURES, DEMONSTRATIONS AND TUTORIALS for postgraduates preparing for higher diplomas in Anæsthetics will be held from 10TH to 21ST FEBRUARY, 1958.

Fees:

Lectures and Demonstrations, £15 15s.

Tutorial Discussion Groups, £10 10s.

Further details and application forms may be obtained from Mr. W. F. DAVIS, Secretary, Faculty of Anæsthetists, Royal College of Surgeons, Lincoln's Inn-fields, London, W.C.2 (Tel. HOLborn 3474, ext. 23).

SHEFFIELD REGIONAL HOSPITAL BOARD

RESEARCH PRIZES

The Sheffield Regional Hospital Board offer 3 Research Prizes of £50 each, for the best written reports or reviews which make a contribution to medical knowledge, to Senior Registrars and Registrars who are or have been employed wholly or partly by the Board.

Further particulars of the conditions for the awards may be obtained from the Secretary to the Board, Fulwood House, Old Fulwood-road, Sheffield, 10, to whom all persons who are interested are invited to apply. The closing date for entries is 1st October, 1958.

COUNCIL OF EUROPE

MEDICAL FELLOWSHIPS 1958

The Council of Europe is again offering a small number of Fellowships for the study of medical and surgical techniques in countries members of the Council. Fellowships will be available for at least 3 months and not exceeding 12 months. Travelling expenses and a monthly stipend will be paid by the Council.

Forms of application and further information may be obtained from the Ministry of Health, Division 5A, Savile-row, W.1. The closing date for return of completed forms of application is 15th January, 1958.

BRITISH POSTGRADUATE MEDICAL FEDERATION. (UNIVERSITY OF LONDON.) INSTITUTE OF ORTHOPÆDICS. CLINICAL RESEARCH ASSISTANT, to work with Director of Studies, from 1st February, 1958. Salary £1350–£100–£1850 (according to qualifications and experience), plus family allowances. Would concurrently have the appointment of Honorary Senior Orthopædic Registrar to the Royal National Orthopædic Hospital. Higher surgical qualifications essential.

Applications, with the names of 2 referees, should reach the Dean, at No. 234, Great Portland-street, London, W.1, by 20th December, 1957.

THE HOSPITAL FOR SICK CHILDREN, Toronto, Canada. RESEARCH FELLOW for the 2-year period July 1958–60. Duties to include clinical work and research in Department of Neurology. An interest in neurology or metabolic disorders preferred. Salary $5000–$5500 a year.

Applications, stating age, qualifications and experience, should be sent via air mail to The Director, The Research Institute, The Hospital for Sick Children, 555, University-avenue, Toronto.

MAKERERE COLLEGE. THE UNIVERSITY COLLEGE OF EAST AFRICA. Applications are invited for LECTURESHIP IN ANÆSTHESIA in the Department of Surgery. Present scale £1446–£1989 p.a., entry point according to qualifications and experience. Child allowance £50 p.a. (maximum £150 p.a.). F.S.S.U. Rent, according to quarters provided, £45 to £85 p.a., including basic furniture. Passages paid (up to 4 adult fares) on appointment, termination and leave (3 months every 21 months). Appointment on secondment (minimum 21 months) considered. Duties to be assumed as soon as possible after 1st July, 1958.

Detailed applications (6 copies), naming 3 referees, by 16th January, 1958, to Secretary, Inter-University Council for Higher Education Overseas, 29, Woburn-square, London, W.C.1, from whom further information can be obtained.

UNIVERSITY COLLEGE, Ibadan, Nigeria. Faculty of MEDICINE. Applications are invited for SENIOR LECTURESHIP or LECTURESHIP in Preclinical Department of Pharmacology. Appointment, from January, 1958, for 3 years in first instance.

Salary scales :—

Medically qualified candidates :—
Senior Lecturer : £1700–£100–£2200 p.a.
Lecturer (Grade I) £1400–£100–£1600 ; £1650 p.a.
Lecturer (Grade II) : £1000–£100–£1300 p.a.

Non-medically qualified candidates :—
Senior Lecturer : £1700–£75–£1925 p.a.
Lecturer (Grade I) : £1400–£50–£1650 p.a.
Lecturer (Grade II) : £1000–£50–£1300 p.a.

Allowance for up to 3 children, £50 p.a. per child resident in Nigeria, £100 p.a. per child resident elsewhere. Part furnished accommodation at rent not exceeding 7.7 % of salary. Passages for member of staff, wife and up to 3 children below age of 11 years on appointment, overseas leave and termination. F.S.S.U. Outfit allowance £60.

Detailed applications (10 copies), naming 3 referees, by 6th January, 1958, to Secretary, Senate Committee on Colleges Overseas in Special Relation, University of London, Senate House, London, W.C.1, from whom further particulars may be obtained.

Hospital Services: Senior Appointments

NORTH WEST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited from qualified medical practitioners for the whole-time post of SENIOR ADMINISTRATIVE MEDICAL OFFICER at a salary of £2900–£140 (5)–£3600 p.a., subject to National Health Service (superannuation) regulations. Post vacant 1st August, 1958. The duties will be to act as adviser to the Board on the planning, organisation and staffing of the hospital and specialist services of the Region, and such administrative and executive functions as may be assigned to him.

Applications, together with the names of 3 referees, should be addressed to the Secretary of the Board (from whom further particulars of the post may be obtained) at 11A, Portland-place, W.1, by 31st December. Canvassing will disqualify.

ROYAL MASONIC HOSPITAL, Ravenscourt Park, London, W.6. Applications are invited from Fellows of 1 of the Royal Colleges of Surgeons for the appointment of CONSULTANT SURGEON at the above Hospital as from 1st April, 1958. Candidates must be engaged in consulting practice and well established in their profession.

Applications, giving detailed information and the names and addresses of 3 referees, should reach the undersigned (from whom further information may be obtained) on or before 21st December, 1957.

R. E. LAWSON, Secretary and House Governor.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, London, W.1. Applications are invited for the appointment of Part-time CONSULTANT ANÆSTHETIST (5 sessions). Duties to commence 19th May, 1958.

Applications, stating age, qualifications and details of present and previous experience, with names of 3 referees, to be addressed to the House Governor, from whom further particulars can be obtained, by 4th January, 1958.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1. Applications are invited for 2 Part-time CONSULTANT appointments in General Surgery. The posts are tenable from 1st October, 1958, and will be for 5 or 6 sessions each per week. Candidates must be in possession of the F.R.C.S. (England).

Applications (12 copies), with the names of 3 referees, should be submitted to the undersigned before 15th January, 1958.

C. C. CARUS-WILSON, Clerk to the Governors.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Applications are invited from duly qualified medical practitioners for the whole-time post of DEPUTY SENIOR ADMINISTRATIVE MEDICAL OFFICER at a salary of £1900–£100 (5)–£2400 p.a. subject to National Health Service (superannuation) regulations. Experience in hospital administration essential ; D.P.H. an advantage. Duties : to assist the Senior Administrative Medical Officer in the planning, organisation and staffing of the hospital and specialist services of the region and such administrative and executive functions as may be assigned to him.

Applications (15 copies), stating qualifications and experience, together with the names of 3 referees, should be addressed to the Secretary of the Board (from whom further particulars of the post may be obtained) at 10, Augustus-road, Edgbaston, Birmingham, 15, by 16th December, 1957. Canvassing will disqualify.

BIRMINGHAM REGIONAL HOSPITAL BOARD. 2 Part-time SENIOR HOSPITAL MEDICAL OFFICERS in Venereology, V.D. Clinic, Nuneaton (1 notional half-day weekly each). Experience specialty desirable.

Applications (15 copies), stating name, age, qualifications, nationality, present and previous appointments and details of 3 referees, to Secretary, 10, Agustus-road, Birmingham, 15, by 16th December, 1957.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(*a*) Part-time CONSULTANT OPHTHALMOLOGIST (2 notional half-days). Duties in Coventry and Nuneaton area. Wide experience specialty and higher qualification required.

(*b*) Part-time CONSULTANT PATHOLOGIST (9 notional half-days weekly). Duties mainly at the Guest Hospital, Dudley. Higher qualifications and special experience in morbid anatomy and histology required.

(*c*) Whole-time SENIOR CASUALTY OFFICER, Guest Hospital, Dudley. Salary within the scale £1653–£2126 p.a. Tenable up to 4 years. Higher qualification an advantage.

(*d*) Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer), All Saints' Hospital, Birmingham. Opportunity for work in Research in conjunction with Birmingham University. Considerable experience specialty essential.

Applications (15 copies), stating name, age, qualifications, nationality, present and previous appointments and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, by 6th January, 1958.

BRISTOL CLINICAL AREA. SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of CONSULTANT PSYCHIATRIST (child guidance) in the Bristol Clinical Area. The appointment will be on a part-time (6 sessions) basis (Regional Hospital Board—4 sessions : Bristol Local Health Authority—2 sessions). The successful candidate will be appointed to undertake duties at the Bristol Child Guidance Clinic ; he may also be required to visit other hospitals in the clinical area as determined by the Regional Board from time to time.

Applications (12 copies), stating date of birth, qualifications and experience, together with the names and addresses of 2 referees, should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 28th December, 1957.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. ASSISTANT PHYSICIAN in Geriatrics (whole-time), Norfolk and Norwich Area. Main hospital is West Norwich Hospital, where the Geriatric Department is the pivotal point of the area service under the Consultant Physician in Geriatrics. Higher qualification, good experience in general medicine necessary and experience in Geriatrics desirable. Salary scale £1653 15s.–£2126 5s.

Applications (8 copies), stating age, experience and the names of 3 referees, to the Secretary of the Board, 117, Chesterton-road, Cambridge, by 16th December, 1957. Candidates are invited to visit hospitals concerned by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. LIVERPOOL REGIONAL HOSPITAL BOARD. Applications are invited for appointment as CONSULTANT OTORHINOLARYNGOLOGIST for 7 notional half-days a week. The duties comprise 4 notional half-days a week in The United Liverpool Hospitals, in the first instance at the Liverpool Ear, Nose, and Throat Infirmary, where the post will be of junior status, and 3 notional half-days a week with the Liverpool Regional Hospital Board, in the first instance at Clatterbridge Hospital (2 notional half-days) and Aintree Hospital (1 notional half-day). Candidates must possess a registrable qualification and either F.R.C.S. (England, Edinburgh or Ireland) and the D.L.O. or F.R.C.S. in Otology.

Applications, giving full particulars of age, qualifications, &c., and details of present and previous appointments, together with the names of 3 persons to whom reference may be made, should reach the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1, by 21st December, 1957.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for appointment as CONSULTANT OPHTHALMOLOGIST to take up duty in April, 1958. The appointment is for 4 notional half-days a week for duty primarily at St. Paul's Eye Hospital and will be of junior status. Candidates must possess a registrable qualification and either F.R.C.S. (England, Edinburgh or Ireland) and a special Diploma in Ophthalmology or F.R.C.S. in Ophthalmology.

Applications, giving full particulars of age, qualifications, &c. and details of present and previous appointments, together with the names of 3 persons to whom reference may be made, should reach the Secretary, 80, Rodney-street, Liverpool, 1, by 31st December, 1957.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a part-time post as OPHTHALMIC MEDICAL PRACTITIONER, in the grade of Senior Hospital Medical Officer, to provide services for the sight-testing of school-children and children of pre-school age. The appointment will be on a part-time basis of 8 half-days of duty weekly and the terms and conditions will be in accordance with the Authority's application of the Spens report to Northern Ireland.

Application to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 22nd December, 1957.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. Applications are invited for the post of ASSISTANT SURGEON at the Royal Victoria Infirmary under the Board of Governors of the United Newcastle upon Tyne Hospitals. The appointment will be of Consultant status and will be on a maximum part-time basis. By mutual consent this may lead to an appointment on a full-time basis. The successful candidate will be required initially to do 5 sessions in the Casualty and Admissions Department and 4 sessions in a general surgical clinic where he will act as Assistant to the Head of the clinic. He will be eligible for more ward responsibility when a suitable vacancy occurs.

Applications, giving full details and names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne.

NEWCASTLE REGIONAL HOSPITAL BOARD. Assistant PATHOLOGIST (Senior Hospital Medical Officer) whole-time or maximum part-time for the North West Durham Group of hospitals. The Group Pathology Laboratory is situated in the main hospital at Shotley Bridge (633 beds) which is the Regional Thoracic Surgery Centre and has radiotherapy and plastic surgery units. Special experience in hæmatology and/or biochemistry is desirable.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NEWCASTLE REGIONAL HOSPITAL BOARD AND THE UNITED NEWCASTLE UPON TYNE HOSPITALS. CONSULTANT NEUROLOGIST (whole-time or maximum part-time) 7 or 9 sessions for duties in regional hospitals—main centre Newcastle General (783 Beds); beds will also be made available at Chester-le-Street General Hospital. 2 sessions to be given to the Royal Victoria Infirmary, Newcastle upon Tyne.

Applications, together with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne 6, within 28 days.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ASSISTANT PHYSICIAN in Physical Medicine, West Herts Group. Whole-time or maximum sessions, Senior Hospital Medical Officer grade. Duties mainly at Watford Peace Memorial Hospital (208 Beds) and West Herts Hospital, Hemel Hempstead (120 Beds) which may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, before 13th January, 1958.

MANCHESTER REGIONAL HOSPITAL BOARD.

(*a*) Additional part-time (8 notional half-days weekly) CONSULTANT OBSTETRICIAN AND GYNÆCOLOGIST to the Bolton Hospital Centre, comprising Bolton Royal Infirmary, Bolton District General Hospital and associated maternity homes. Wide experience and higher qualifications essential; appointee to live in area. 24th December, 1957.

(*b*) Whole-time RESIDENT CONSULTANT PSYCHIATRIST to the Lancaster Moor Hospital (about 2500 Beds), near Lancaster. Appointee will be designated Deputy Medical Superintendent and will conduct outpatient clinics in the periphery. Wide experience and higher qualifications essential. 23rd December, 1957.

(*c*) Whole-time, NON-RESIDENT ASSISTANT CHEST PHYSICIAN (Senior Hospital Medical Officer) to the Wigan and Leigh Hospital Centre, including the tuberculosis unit at Wrightington Hospital. Previous experience of thoracic medicine and tuberculosis essential, higher qualification desirable. The appointment will be made in conjunction with the Local Health Authorities concerned, for whom the appointee will carry out duties in connection with prevention, care and aftercare of tuberculosis. 30th December, 1957.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by the dates stated.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR ASSISTANT PSYCHIATRIST required at the Middlewood Hospital, Sheffield. Salary scale, £1653 15s.–£52 10s.–£2126 5s. p.a.

Application form and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 28th December, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT RADIOLOGIST for Leicester Royal Infirmary and Leicester General Hospital. The successful candidate will work under the direction of the Consultant Radiologist in Charge and will be required to reside within 10 miles of Leicester Royal Infirmary. Candidates should possess a diploma in Radiology. Salary scale, £1653 15s.–£52 10s.–£2126 5s. p.a.

Application form and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 28th December, 1957.

SHEFFIELD REGIONAL HOSPITAL BOARD. Maximum Part-time CONSULTANT RADIOLOGIST required for the Rotherham Group of hospitals.

Application form and further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 4th January, 1958.

WELSH REGIONAL HOSPITAL BOARD. Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer), Morgannwg Hospital, Bridgend, Glamorgan. Accommodation available for single or married persons. Hospital possesses Neurosis Centre, Child Guidance Clinic, Psychological Department, extensive Outpatient Clinics, well-equipped Pathological and Electroencephalographic laboratories and social clubs.

Applications (12 copies), naming 3 referees, to Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 21 days.

ISLE OF MAN. NATIONAL HEALTH SERVICE. Applications are invited for the part-time post of VISITING CONSULTANT in Pædiatrics. The post involves regular monthly visits to the Isle of Man, and the provision of services for 1 notional half-day at each visit. A further notional half-day is added in respect of time spent in travelling between the United Kingdom and the Isle of Man for each visit. Travelling expenses and subsistence allowances in accordance with an approved scale are paid by the Board. Remuneration and conditions of service, including superannuation, under the Isle of Man scheme are essentially the same as those for similar posts in the United Kingdom.

Application forms from the undersigned, to be returned by 14th December, 1957. G. S. FORSTER, Secretary,
Isle of Man Health Services Board.

3, Harris-terrace, Douglas.

WEST CORNWALL CLINICAL AREA. SOUTH-WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of CONSULTANT VENEREOLOGIST in the West Cornwall Clinical Area. The appointment will be on a part-time basis (3 sessions). The successful candidate will undertake outpatient clinics in the clinical area, and will have access to beds as required.

Applications (12 copies), stating date of birth, qualifications and experience, together with the names and addresses of 2 referees should be sent to the Secretary of the Regional Hospital Board, 27, Tyndalls Park-road, Bristol, 8, not later than 28th December, 1957.

SOUTH AFRICA. PROVINCIAL ADMINISTRATION OF THE CAPE OF GOOD HOPE. HOSPITAL SERVICE: VACANCY. Provincial Hospital, Port Elizabeth. Applications are invited from suitably qualified persons for appointment to the following vacant post at the Provincial Hospital, Port Elizabeth :—

Department of Radiology

Medical Practitioner, grade D, with salary at the rate of £1740 p.a. (fixed).

In addition to the basic salary, a non-pensionable cost-of-living allowance at rates prescribed from time to time by the Administrator (at present amounting to £234 p.a.) is payable to certain whole-time married officials and employees.

The conditions of service are governed by the relevant Ordinances and Regulations.

Candidates must be registered Specialists or must be in possession of appropriate postgraduate diploma(s) or degree(s) in radiology, and are requested to furnish particulars in regard to the following :—

(*a*) Academic achievements (degrees and diplomas held and the standard of achievement in professional examinations, scholarships and special awards).

(*b*) Professional experience (not only the name of the employer but also that of the institution in which the candidate worked and the type of work undertaken).

(*c*) Names of 3 referees (1 of these should preferably be someone occupied in the same branch of medicine as the candidate), who should be asked by the candidate to submit confidential reports to the Director of Hospital Services before the closing date for the receipt of applications.

Applications must be made in duplicate on the prescribed form, Staff 23, which is obtainable from the office of the Immigration Attaché for the Union of South Africa, South Africa House, Trafalgar-square, London, W.C.2. Details as regards conditions of service and transport of the above-mentioned.

The completed application forms must be addressed to the Director of Hospital Services, P.O. Box 2060, Cape Town, South Africa, and must reach him not later than the 28th December, 1957.

Candidates must state the earliest date on which they can assume duty.

ST. JOHN'S, NEWFOUNDLAND, CANADA. HOSPITAL FOR MENTAL AND NERVOUS DISEASES. PSYCHIATRIC Posts. Several vacancies exist in the above Hospital for physicians with psychiatric experience or those who wish to enter a recognised training programme affiliated with a university and leading to examination in the specialty by the Royal College of Physicians and Surgeons of Canada. The training posts offer candidates formal training and supervision in mental hospital inpatient departments, day care and outpatient clinic and general hospital outpatient clinics, and 2 years in a university setting. In the hospital programme there are organised departments of psychology, social service, occupational and recreational therapy. Posts are pensionable. Annual vacation of 24 working days based on a 5-day week. Transportation to St. John's paid on the basis of a 2-year service contract.

Salary:

Training posts:	
1st year	$6000 p.a.
2nd year	$6500 p.a.
3rd year	$7000 p.a.
4th year	$7000 p.a.

Clinical posts: $6000–$9500 p.a. depending upon qualifications and experience.

Applications in writing and/or requests for further information should be forwarded as soon as possible to:

C. H. POTTLE, M.D., Superintendent.
Hospital for Mental and Nervous Diseases,
St. John's, Newfoundland, Canada.

Hospital Services: Junior Appointments

ANNIE McCALL MATERNITY HOSPITAL, Jeffreys-road, S.W.4. Applications are invited from registered Women medical practitioners for the post of RESIDENT OBSTETRIC HOUSE SURGEON (post recognised for the D.Obst.R.C.O.G.). Appointment is for a period of 6 months, vacant 2nd January, 1958.

Applications, stating age, qualifications with dates, and nationality, accompanied by copies of 3 recent testimonials, to the Secretary, not later than 14th December, 1957.

BROMPTON HOSPITAL, S.W.3. Applications invited for post of TEMPORARY MEDICAL REGISTRAR (whole-time). Salary within the Registrar grade. Appointment is for 1 year and involves duties at a chest Clinic under the South West Metropolitan Regional Hospital Board as well as Brompton Hospital. Candidates must hold the M.R.C.P. Diploma or the M.B. of a University.

Applications, stating age, qualifications with dates, nationality, and appointments held, together with copies of testimonials, by 14th December, 1957, to KENNETH A. F. MILES, House Governor.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required. Post-registration in Gastroenterological Department. Appointment 1st February, 1958.

Applications, with 2 testimonials, to Medical Director by 14th December.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT SENIOR HOUSE OFFICER required in Anæsthetic Department. Whole-time appointment for 6 months, renewable. Post vacant 15th January, 1958. Previous experience in Anæsthesia essential. Post recognised for the D.A. and F.F.A. R.C.S.

Applications, with copies 2 testimonials or names 2 referees, to Medical Director by 14th December.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required in General Medical Department, including hæmatology and endocrinology. Pre-registration appointment from 1st February, 1958.

Applications, with 2 testimonials, to Medical Director by 14th December.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required in Surgical Department. Post vacant 1st February, 1958. Pre-registration candidates will be considered.

Applications, with 2 testimonials, to Medical Director by 14th December.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER required in General Surgery and Urological Department. Pre-registration candidates would be considered. Post vacant 24th December.

Applications, with 2 testimonials, to Medical Director by 14th December.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (123 Beds.) Applications are invited for the post of SECOND CASUALTY OFFICER with duties in the Department of Orthopædic and Traumatic Surgery (Senior House Officer grade). Recognised for F.R.C.S. Salary £819 10s. p.a. less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

GROUP LABORATORY, Mile End Hospital, Bancroft-road, London, E.1. RESIDENT ASSISTANT PATHOLOGISTS (Senior House Officer grade). Previous experience an advantage but not essential. Laboratory recognised for Diploma of Pathology and is well equipped with excellent training facilities. Posts vacant on 14th January and 18th February, 1958, respectively.

Applications, stating age, nationality, qualifications, experience and the names of 2 referees, to be sent to the Secretary, Stepney Group Hospital Management Committee, Mile End Hospital, Bancroft-road, E.1, not later than 21st December, 1958.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications for the 6 months' resident appointment now vacant of CASUALTY OFFICER AND HOUSE SURGEON (E.N.T.) should be sent to Secretary, above address.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL, Ducane-road, London, W.12. Joint appointment with the North West Metropolitan Regional Hospital Board. Whole-time REGISTRAR (orthopædic) required. Post vacant in January. Appointment tenable firstly at Heatherwood Hospital, Ascot (resident if required), studying long-term orthopædic surgery, transferring to Hammersmith Hospital and the Postgraduate Medical School (non-resident) on 1st August, 1958, studying orthopædic and traumatic surgery.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, The Hammersmith, West London and St. Mark's Hospitals, Ducane-road, London, W.12, by 28th December.

KING EDWARD MEMORIAL HOSPITAL, Ealing. HOUSE OFFICER in Gynæcology with some obstetric duties at Perivale Maternity Hospital, Greenford. Pre-registration Surgical Post. Vacant 18th January. Preference given to persons seeking second pre-registration post under Medical Act, 1950.

Applications, stating age, nationality, qualifications and experience, with copies of 2 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, Middlesex, by 16th December.

LONDON CHEST HOSPITAL. Hospitals for Diseases of THE CHEST. 2 vacancies occur 1st February, 1958, for RESIDENT HOUSE PHYSICIAN. Appointment for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and post graded as House Officer. Duties include work in the Outpatient Department and special clinics, as well as in wards.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 20th December.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

MARIE CURIE HOSPITAL, 66, Fitzjohn's-avenue, Hampstead, N.W.3. HAREFIELD AND NORTHWOOD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER (House Officer grade) required immediately.

Applications, with copies of testimonials, to the Administrative Officer by 24th December, 1957.

METROPOLITAN HOSPITAL. Kingsland-road, London, E.8. (General—146 Beds.) Applications are invited for the pre-registration posts of 2 HOUSE PHYSICIANS and 3 HOUSE SURGEONS, 4 posts vacant 1st January, 1958, and 1 House Surgeon post vacant 1st February, 1958.

Applications from provisional and fully registered candidates, stating age, nationality, qualifications and experience, with copies of 3 recent testimonials, to the Hospital Secretary by 11th December, 1957.

MILE END HOSPITAL, Bancroft-road, London, E.1. (484 Beds.) HOUSE PHYSICIAN (pre- or post-registration), post vacant 1st January, 1958.

Application forms, obtainable from Physician-Superintendent, to be returned by 13th December, 1957, with copies of not more than 3 testimonials.

MIDDLESEX HOSPITAL, W.1. Applications invited for post of CASUALTY SURGICAL REGISTRAR.

Rules and application forms obtainable from Deputy Superintendent should be returned, naming 2 referees, by 31st December.

NEW END HOSPITAL, Hampstead, N.W.3. Medical REGISTRAR (endocrinology) required. Vacant 1st January, 1958. General hospital of 220 Beds with a special department for endocrinology (27 Beds). Hospital may be visited by direct appointment with Surgeon-Superintendent.

Application forms obtainable and returnable to Group Secretary, Archway Group Hospital Management Committee, 46, Cholmeley-park, London, N.6 (ARC. 3070, Ext. 527), by 16th December, 1957.

NORTH MIDDLESEX HOSPITAL, London, N.18. Senior HOUSE OFFICER (pædiatrics) resident, required for 10th February, 1958 (Locum 27th January–9th February). Previous experience desirable. Recognised for D.C.H. Appointment for 6 months in the first instance with possible extension to 1 year.

Applications, giving full particulars, with copies of recent testimonials and/or names of 2 referees, to Secretary of Hospital, by 21st December.

NORTH MIDDLESEX HOSPITAL, London, N.18. Locum REGISTRAR required immediately in Department of Pathology, for duties mainly in hæmatology. Non-resident, but required to sleep in hospital when on duty for emergency work.

Applications, giving full particulars of qualifications and experience, with names of 2 referees, to Hospital Secretary.

PADDINGTON GENERAL HOSPITAL, Harrow-road, W.9. (582 Beds.) Applications are invited to fill the post of SENIOR HOUSE OFFICER (casualty), resident on duty (1 of 3). Recognised for F.R.C.S.

Applications, stating age, experience, qualifications, together with names and addresses of 2 referees, to be sent to Hospital Secretary immediately.

QUEEN ELIZABETH HOSPITAL FOR CHILDREN, Hackney-road, E.2, Shadwell, E.1, and BANSTEAD, SURREY. 2 HOUSE OFFICER appointments :—

(i) For 2 consecutive periods of 6 months commencing 1st February, 1958. First period House Physician, Hackney-road, second period House Surgeon, Hackney-road and Casualty Officer, Shadwell.

(ii) For 6 months from 1st February, 1958, as House Physician, Hackney-road.

Application forms may be obtained from the Secretary at Hackney-road, and should be returned with copies of not more than 3 testimonials, not later than 14th December, 1957.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 342, Great Portland-street, London, W.1, and Brockley Hill, STANMORE, MIDDLESEX. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (3 vacancies) for a period of 6 months, 2 to commence duties at Great Portland-street on 3rd February, 1958, and 10th March, 1958, and 1 to commence duties at the Country Hospital, Stanmore, on 29th January, 1958.

Applications, stating preference, to be received by 17th December, 1957. Forms of application can be obtained from the House Governor at 234, Great Portland-street, W.1.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Brockley Hill, STANMORE, MIDDLESEX. Applications are invited for the post of Whole-time REGISTRAR in Anæsthetics (resident). Duties to commence 1st February, 1958.

Applications, with names of 3 referees, to be addressed to the House Governor, 234, Great Portland-street, London, W.1, by 17th December.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Women medical practitioners for the post of HOUSE PHYSICIAN. Vacant March, 1958, for a period of 6 months.

Forms of application from the Secretary.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Woman) (Senior House Officer grade). Appointment is for 6 months, renewable. Duties include care of Children's Ward, medical beds, E.N.T., and administration. Offers suitable experience to those intending to enter general practice. Vacant 1st March, 1958.

Forms of application from the Secretary.

ST. ALFEGE'S HOSPITAL, Greenwich, S.E.10. (367 Beds.) CLINICAL ASSISTANT required for 1 notional half-day session weekly, on Thursday morning, in Ophthalmic Department at above Hospital, for 1 year in first instance. Salary £183 15s. p.a.

Applications and testimonials to Secretary, Greenwich and Deptford Hospital Management Committee, at above Hospital by 23rd December.

ST. ANDREW'S HOSPITAL, Devons-road, Bow, E.3. HOUSE PHYSICIAN. Recognised pre-registration appointment. Applications, with copy of at least 1 testimonial, should be sent to Hospital Secretary immediately.

ST. ANN'S GENERAL HOSPITAL, N.15. Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN (Senior House Officer) to above Hospital for duty in the Infectious Diseases Unit and other general duties, for a period of 6 months from 19th January, 1958.

Application form from Secretary, Tottenham Group Hospital Management Committee, The Green, N.15, to be returned by 18th December, 1957.

ST. CHARLES' HOSPITAL. Ladbroke-grove, W.10. (575 Beds.) Applications are invited to fill the post of SENIOR HOUSE OFFICER (orthopædic and plastic wards (2)). Previous experience in 1 or both specialties desirable. Post vacant 1st January, 1958.

Applications, stating age, qualifications, experience, &c., together with names and addresses of 2 referees, to be sent to Hospital Secretary immediately.

ST. CHARLES' HOSPITAL, Ladbroke-grove, W.10. (575 Beds.) Applications are invited for the undermentioned posts commencing 1st January, 1958 :—

2 HOUSE SURGEONS (general), pre-registration.
2 HOUSE PHYSICIANS (general), pre-registration.
SENIOR HOUSE OFFICER (tuberculosis).

Applications, stating age, qualifications, experience, &c., together with names and addresses of 2 referees, to reach Hospital Secretary by 16th December, 1957.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of RESIDENT ANÆSTHETIST, in the grade of House Officer, to St. George's Hospital. This is a post-registration appointment. The appointment will be for 6 months from 1st January, 1958.

Applications, stating age, education, qualifications and experience should reach the undersigned not later than 14th December, 1957. P. H. CONSTABLE, House Governor.

ST. GEORGE'S HOSPITAL, S.W.1. Applications are invited for the post of SENIOR REGISTRAR to the department of Psychiatry. The inpatient work of the Department is at the Atkinson Morley's Hospital, and the outpatient work at St. George's Hospital. The appointment is for 1 year in the first instance, and the successful candidate will be required to take up duty as soon as possible.

Applications, stating age, education, qualifications, experience, and the names and addresses of 2 referees, should reach the undersigned not later than 14th December.

P. H. CONSTABLE, House Governor.

ST. JOHN'S HOSPITAL, Lewisham, London, S.E.13. Applications are invited for the resident post of SENIOR HOUSE SURGEON at the above Hospital. Vacant 8th January, 1958. Recognised for 6 months' training for F.R.C.S. Salary £819 10s. p.a., less £150 for residential emoluments.

Applications, stating age, qualifications and experience, with copy testimonials or names of referees, to the Group Secretary at Lewisham Hospital, S.E.13.

ST. MARY'S HOSPITAL, Paddington, W.2. House Officer to the Almroth Wright Wards required for a period of 8 months with effect from 1st February, 1958 (first 2 months non-resident remaining 6 months resident). Remuneration at Senior House Officer rates.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 28th December, 1957.

ST. THOMAS'S HOSPITAL, London, S.E.1. Medical REGISTRAR, whole-time, for 1 year in the first instance from 1st March, 1958.

Applications, naming 2 referees, to Clerk of the Governors by 20th December, 1957.

ST. THOMAS'S HOSPITAL, London, S.E.1. Resident REGISTRAR to the Department of Anæsthetics for 1 year in the first instance from as soon as possible after 1st January, 1958.

Applications, naming 2 referees, to Clerk of the Governors by 20th December, 1957.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There is a vacancy for a Part-time RESEARCH WORKER in Juvenile Psychosis for a period of 1 year, part-time Medical Officer grading.

Further particulars and forms of application, which must be returned by 31st December, may be obtained from the undersigned.

H. F. RUTHERFORD,
House Governor and Secretary.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, W.C.1. Applications are invited for the post of SENIOR MEDICAL REGISTRAR for 1 year in the first instance, from 1st January, 1958, or as soon as possible thereafter. If one of the present medical registrars is appointed to this post there will be a vacancy for a medical registrar, in which case the appointment will include a period of duty at the Whittington Hospital, N.19. Preference will be given to candidates holding higher qualifications. Candidates should state whether they are applying for 1 or both appointments.

Applications, with the names of 2 referees, to T. F. W. MACKEOWN, Administrator and Secretary, by 18th December, 1957.

WANSTEAD HOSPITAL, Hermon Hill, London, E.11. (191 Beds.) HOUSE SURGEON required, post vacant 24th December, 1957. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WEST LONDON HOSPITAL, Hammersmith-road, London, W.6. RESIDENT HOUSE SURGEON (general and orthopædic) required. Post vacant 3rd January. Pre-registration candidates considered.

Applications, stating age, qualifications, experience, copies 2 recent testimonials, to Secretary by 14th December.

WILLESDEN CHEST CLINIC, Pound-lane, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Chest Diseases at above Clinic. Duties comprise work in Clinic, on the district, and supervision of beds in Central Middlesex Hospital, and will include teaching. Essential requirements: Higher medical qualifications and good training in general medicine. Applications from Senior Registrars in general medicine would be welcome. Appointment subject to annual review. Clinic may be visited by direct appointment.

Application forms obtainable from and returnable to Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 30th December, 1957.

WILLESDEN GENERAL HOSPITAL, Harlesden-road, N.W.10. Locum ANÆSTHETIC REGISTRAR required, 2 months or longer.

Apply Hospital Secretary.

WILLESDEN GENERAL HOSPITAL, Harlesden-road, N.W.10. RESIDENT CASUALTY OFFICER required 26th December. Senior House Officer post, recognised for Fellowship. RESIDENT HOUSE PHYSICIAN required 27th December. Pre-registration candidates eligible. 6 months' appointments.

Applications, with full particulars, to Hospital Secretary by 11th December.

WOOLWICH GROUP HOSPITAL MANAGEMENT COM-MITTEE. HOUSE SURGEONS. 5 posts vacant 1st January, 3 at Memorial Hospital, Woolwich, 2 at St. Nicholas Hospital, Plumstead. All recognised for F.R.C.S., and approved for pre-registration service.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited for 2 appointments as REGISTRARS in Surgery, with duties in the Aberdeen Royal Infirmary and other Hospitals. Both posts are whole-time ones and non-resident. Salary and conditions of service are in accordance with the terms issued by the Department of Health for Scotland.

Applications, giving details of qualifications and experience, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, P.O. Box No. 92, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ALTON, HAMPSHIRE. HENRY GAUVAIN HOSPITAL. (112 Beds.) LORD MAYOR TRELOAR GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for the above Hospital for a period in the first instance of 6 months. Post vacant 1st February, 1958. Non-pulmonary tuberculosis, orthopædic and general surgery. Primary or final F.R.C.S. candidate preferred, married or single, to live in small cottage on estate.

Applications, together with the names and addresses of 3 referees, to Hospital Secretary, Henry Gauvain Hospital, Alton, Hants.

ASCOT, BERKSHIRE. HEATHERWOOD ORTHO-PÆDIC HOSPITAL. ORTHOPÆDIC REGISTRAR required February. Hospital is a regional centre for all general orthopædic conditions, including fractures, and performs a large amount of outpatient work. Post recognised for F.R.C.S.

Application forms from and returnable to Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 14th December.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE SURGEON for general surgical duties. 6 months' appointment, vacant in early December, 1957. Preference given to pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (resident) required for Casualty Department, Ashton-under-Lyne General Hospital. Appointment limited to 4 years. Minimum commencing salary £852 10s. p.a., but higher salary may be paid according to experience and qualifications. There may be some orthopædic duties to be undertaken by the holder of this post. Recognised under F.R.C.S. regulations.

Apply, giving age, experience, qualifications and 2 references, to Group Secretary, General Hospital, Ashton-under-Lyne.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGE-MENT COMMITTEE. Locum JUNIOR HOSPITAL MEDICAL OFFICER (anæsthetics) required at Ashton-under-Lyne General Hospital for period 27th January to 31st May, 1958.

Applications, with names of 2 referees, to Group Secretary, General Hospital, Ashton-under-Lyne.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON (pre-registration); vacant now. The Hospital serves a wide area of pleasant countryside and the post affords good opportunity to study excellent clinical material.

Apply to Group Secretary, 19, Alexandra-road, Barnstaple.

BEDFORD GENERAL HOSPITAL. (436 Beds.) Applica-tions are invited for the following posts :—

RESIDENT SENIOR HOUSE OFFICER (obstetrics and gynæcology) required early February. Hospital may be visited by direct appointment.

RESIDENT HOUSE SURGEON (obstetrics and gynæcology) required mid January. Post recognised for D.Obst.R.C.O.G. The Maternity Unit comprises 75 obstetric and 26 gynæcological beds and the Hospital has a busy outpatient department.

Detailed applications, with copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by 18th December.

BEDFORD GENERAL HOSPITAL. (436 Beds.) Applica-tions are invited for the following posts :—

HOUSE SURGEON post, vacant immediately. Pre- or post-registration ; recognised for F.R.C.S. Post offers exceptional opportunities for general experience in busy acute surgical units.

ORTHOPÆDIC HOUSE SURGEON post, vacant immediately. Pre- or post-registration ; recognised for F.R.C.S. Post offers wide experience in a busy specialist orthopædic and traumatic unit.

Applications, stating age, qualifications, experience, copies of 2 recent testimonials, to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BIRMINGHAM ACCIDENT HOSPITAL, Bath-row, BIRMINGHAM, 15. (215 Beds and 8 House Surgeons.) HOUSE SURGEONS (resident). Vacant January/February. Hospital largest traumatic unit in country and treats over 50,000 new patients each year. Recognised for purpose of casualty by R.C.S. (Eng.). Teaching programme by consultant staff. 6-month appointment, some of which may be spent in 42-Bedded Medical Research Council's Burns Unit.

Apply, naming 2 referees, to Administrator.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (775 Beds.) Pædiatric Department. HOUSE PHYSICIAN. Recognised for pre-registration and D.C.H. Vacant 1st February, 1958. The Department of 83 pædiatric beds or cots and 100 neonatal cots is under the direction of 2 Consultant Pædiatricians. Facilities for postgraduate instruction and attendance at clinics. Undergraduates of the University of Birmingham attend Department for clinical instruction.

Applications, marked Pædiatrics, to the Group Secretary, with copies of 3 recent testimonials.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (775 Beds.) 3 HOUSE PHYSICIANS (general medicine). Recognised for pre-registration. Vacant 13th January, 1st and 20th February, 1958. Each appointment is responsible for approximately 80 Male and Female adult medical beds in a unit of General Medicine under control of 2 Consultant Physicians.

Applications, marked "House Physician," enclosing copies of 3 recent testimonials, to Group Secretary.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (775 Beds.) 2 HOUSE SURGEONS (general surgery). Recognised for pre-registration and F.R.C.S. Vacant 4th and 8th January, 1958. Each appointment is in a unit of approximately 85 adult and children's general surgical beds under control of 2 Consultant Surgeons.

Applications, marked "House Surgeon," to Group Secretary, enclosing copies of 2 recent testimonials.

BIRMINGHAM, 9. LITTLE BROMWICH GENERAL HOSPITAL. PÆDIATRIC HOUSE PHYSICIAN (Male/Female). Post vacant 1st February, 1958. Recognised for D.C.H. Includes duties on Infectious Diseases Wards, Neonatal Department and Clinics.

Applications to the Physician-Superintendent.

BIRMINGHAM (near). MIDLAND CENTRE FOR NEUROSURGERY. Holly-lane, SMETHWICK, near BIRMINGHAM. RESIDENT SENIOR HOUSE OFFICER, vacant 1st January, 1958. (Recognised for period of 6 months' unspecified training under R.C.S. regulations.) This is a new Hospital entirely devoted to Neurology and Neurosurgery, within easy reach of Birmingham. Salary on national scale less deduction for board, lodging, &c.

Applications, with names of 2 referees, to the Group Secretary, West Bromwich and District Hospitals Management Committee.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

1. **Coventry No. 20 Group, Coventry and Warwickshire Hospital, Coventry**

REGISTRAR (anæsthetics) for Coventry and Warwickshire and Guison Hospitals, Coventry. Experience specialty essential. Recognised F.F.A. R.C.S. Resident.

2. **Mid-Worcestershire Group, Birmingham-road, Bromsgrove**

REGISTRAR (obstetrics/gynæcology). Duties at Bromsgrove General Hospital (423 Beds) (7 notional half-days), and Dudley and Stourbridge Group (4 notional half-days).

3. **Wolverhampton Group, The Royal Hospital, Wolverhampton**

REGISTRAR (diagnostic radiology) for The Royal Hospital, Wolverhampton (Associated Hospital of Birmingham University Medical School). Part I Diploma of Medical Radiology essential. Hospital recognised for Part II. Duties also at other Hospitals in the Group.

4. **Shrewsbury Group, Royal Salop Infirmary, Shrewsbury**

(*a*) REGISTRAR (obstetrics and gynæcology), Royal Salop Infirmary/Copthorne Hospital. Considerable clinical responsibility. House Surgeon posts (only) recognised for M.R.C.O.G.

(*b*) REGISTRAR (radiology (radiodiagnosis)), Shrewsbury Group and Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry. Resident or non-resident.

5. **Birmingham (Selly Oak) Group, Oak Tree-lane, Birmingham, 29**

(*a*) REGISTRAR (radiology), Selly Oak Hospital (1055 Beds) with associated maternity, eye, E.N.T. and infectious diseases hospitals. All forms of radio-diagnostic work undertaken. Hospital recognised for Part II D.M.R.D. Diploma in radiology desirable but consideration given to holders of Part I only.

(*b*) REGISTRAR (surgical) for Birmingham Accident Hospital. Duties with Accident Surgery Team and M.R.C. Burns Unit. General surgical experience essential. Higher qualifications an advantage. Opportunity for research.

Application forms from Group Secretaries to be returned by 16th December, 1957.

BIRMINGHAM (SANATORIA) GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at West Heath Hospital, Rednal-road, Birmingham, 31, vacant 1st January, 1958. (207 Beds for the treatment of tuberculous and non-tuberculous chest cases.) The successful applicant will reside at the above Hospital (accommodation for single person only), and will be offered facilities for undertaking duties at the Birmingham Chest Clinic, Great Charles-street, Birmingham, 3.

Applications, stating age, qualifications, training and experience, together with copies of 3 recent testimonials, should be addressed to the Group Secretary, Birmingham (Sanatoria) Group Hospital Management Committee, Yardley Green Hospital, Birmingham, 9.

BIRMINGHAM, 29. SELLY OAK HOSPITAL. (Equipped beds 955.) Applications are invited for the following posts:—

4 HOUSE PHYSICIANS.
1 HOUSE PHYSICIAN (pædiatrics). Recognised for D.C.H. Some duties at Moseley Hall Hospital for Children.
3 HOUSE SURGEONS. Recognised for F.R.C.S.
2 HOUSE SURGEONS (gynæcology and obstetrics). Recognised for M.R.C.O.G.

The above posts will be available on or about 14th January, 1958, and are recognised for pre-registration service.

Apply to the Medical Superintendent, giving qualifications, age and experience, and enclosing copies of 3 testimonials. Closing date, 14th December, 1957.

BIRMINGHAM. GROUP 25 (SELLY OAK) HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Pathology. Post offers considerable experience either for those desirous of a career in pathology, or working for M.R.C.P. or F.R.C.S.

Full details from the Pathologist, Selly Oak Hospital, Birmingham, 29.

BIRMINGHAM, 13. SORRENTO MATERNITY HOSPITAL. (106 Beds, including 24 premature baby cots.) OBSTETRIC HOUSE SURGEON. Appointment recognised for D.Obst.R.C.O.G. Hospital affiliated to Birmingham Medical School for training of students. Vacant 1st February, 1958.

Applications to the Obstetrician, Sorrento Maternity Hospital, not later than 16th December.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. THE CHILDREN'S HOSPITAL, Ladywood-road, BIRMINGHAM, 16. Applications are invited for the post of MEDICAL REGISTRAR (non-resident) for the University Department of Pædiatrics and Child Health, vacant on 1st January, 1958. Postgraduate experience, including at least 6 months' pædiatric training is required. Preference will be given to candidates with a higher qualification.

Application forms are obtainable from the House Governor and should be returned to him by 14th December, 1957.

G. A. PHALP, Secretary to the Board of Governors.

BIRMINGHAM, 9. YARDLEY GREEN HOSPITAL. THORACIC SURGICAL UNIT. (66 Beds.) Vacancy for SENIOR HOUSE OFFICER. No previous experience in thoracic surgery necessary.

Applications, stating age, qualifications, training and experience, together with names of 2 referees, to be addressed to Group Secretary, Yardley Green Hospital, Birmingham, 9.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) HOUSE PHYSICIAN (House Officer or Senior House Officer grading according to experience).

Apply Group Secretary.

BEXLEY HOSPITAL, Dartford Heath, Bexley, Kent. BEXLEY HOSPITAL MANAGEMENT COMMITTEE. Applications invited for appointment of SENIOR HOUSE OFFICER at above Hospital. Salary £819 10s. p.a., with deductions of £150 p.a. for board, lodging, &c., if resident. The Hospital (2300 Beds) deals with all types of psychiatric illness and experience in all modern physical, occupational and psychotherapeutic procedure is available. Opportunities will be available to assist at outpatient clinics.

Applications, with names and addresses of 3 referees, should be sent to the Acting Physician-Superintendent, Dr. M. RADZAN, within 14 days of the appearance of this advertisement.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (pathology) required for duties at Royal Infirmary, Blackburn (Group Laboratory), but may also be required for duties at Queen's Park Hospital, Blackburn, and Victoria Hospital, Accrington, at Consultant's discretion. Recognised for D.Path.

Applications, with names of 2 referees, to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER required immediately for established Geriatric Department under control of Consultant Geriatrician. There are 360 geriatric beds at Queen's Park Hospital, Blackburn, Springfield Hospital, Blackburn, and Clitheroe Hospital, Clitheroe. Accommodation for married man may be available if required.

Applications, with names and addresses of 2 referees, to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN. ROYAL INFIRMARY. (262 general beds.) BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required immediately. Post recognised for F.R.C.S. and approved for pre-registration purposes.

Applications to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn, Lancs.

BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. GROUP LABORATORIES. RESIDENT PATHOLOGIST (Senior House Officer grade). Now vacant, tenable for 12 months and recognised for the Dip.Path.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, WESTBOURNE. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the immediate appointment of SENIOR HOUSE OFFICER (resident), for E.N.T. duties. The appointment is recognised for the D.L.O. diploma and facilities are provided for studying.

Applications to the Hospital Secretary, Royal Victoria Hospital, Shelley-road, Bournemouth.

BRADFORD. ST. LUKE'S HOSPITALS. (Beds: maternity 125, gynæcology 105.) SENIOR HOUSE OFFICER (obstetrics/gynæcology) required for large combined unit. Recognised for D.Obst.R.C.O.G. and M.R.C.O.G. Excellent experience to be obtained.

Applications, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRISTOL. UNITED BRISTOL HOSPITALS. Applications are invited from suitably qualified medical practitioners for 3 sessions in the Psychiatric Outpatient Department, 1 in the Royal Infirmary and 2 in the Royal Hospital for Sick Children. The successful candidate will be remunerated in accordance with the provisions of section 10(b) of the terms and conditions of service agreed between the Minister and the Medical Profession.

Applications, giving particulars of qualifications and experience and the names of 3 referees, should be sent to the Secretary to the Board of Governors, Bristol Royal Infirmary, Bristol, 2, from whom further particulars may be obtained, not later than Saturday, 28th December, 1957.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) RESIDENT ANÆSTHETIST (Senior House Officer grade) required for 1 year with interchange of duties, by agreement, at the Brighton General Hospital and other specialised units within the Brighton and Lewes Group. Vacant 21st December. Post recognised for F.F.A.R.C.S., and D.A.

Applications, stating age, nationality and experience, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (314 Beds.) 2 CASUALTY HOUSE SURGEONS required 28th December and 22nd January. Duties include work in orthopædic and traumatic unit. Recognised for pre-registration and F.R.C.S.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. SENIOR CASUALTY OFFICER (Junior Hospital Medical Officer), non-resident, required mid-December, at the above Hospital. Recognised for F.R.C.S.

Applications as locum or for permanent post, stating usual particulars and the names of 2 referees, to the Administrative Officer.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEONS (3). Applications are invited for 3 pre-registration posts in general surgery which will be falling vacant during January and February, 1958. 2 of the posts are at Bury General Hospital and the third at Rossendale General Hospital.

Apply, stating age, qualifications and other details, to the Group Secretary at Bury General Hospital, Bury, Lancs.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. ROSSENDALE GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (medical).

Apply, stating full details including age, experience, nationality, and names of 2 referees, to the Group Secretary at Bury General Hospital, Bury, Lancs.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. ADDENBROOKE'S HOSPITAL, CAMBRIDGE. MEDICAL REGISTRAR (non-resident) for 1 year in first instance, renewable for second year.

Apply to Secretary, stating age, nationality, qualifications and experience with dates, and names of 3 referees, by 17th December, 1957.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. ADDENBROOKE'S HOSPITAL, CAMBRIDGE. HOUSE PHYSICIAN for 6 months from 31st January. Recognised pre-registration service.

Apply to the Secretary by 21st December, stating age, nationality, qualifications and experience with dates, and with copies of 3 testimonials. Interviews early January.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. ADDENBROOKE'S HOSPITAL, CAMBRIDGE. GYNÆCOLOGICAL HOUSE SURGEON for 6 months from 1st February. Second or subsequent post. Recognised for pre-registration service and M.R.C.O.G.

Apply to the Secretary by 21st December, stating age, nationality, qualifications and experience with dates, and with copies of 3 testimonials. Interviews mid-January.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. ADDENBROOKE'S HOSPITAL, CAMBRIDGE. HOUSE SURGEON (in Orthopædic Department) for 6 months from 8th February. Recognised pre-registration service.

Apply to the Secretary by 21st December, stating age, nationality, qualifications and experience with dates, and with copies of 3 testimonials. Interviews mid-January.

CARDIFF. ST. DAVID'S HOSPITAL. Senior House OFFICER required in Geriatric Unit (200 Beds) commencing 1st February, 1958.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARMARTHEN. WEST WALES GENERAL HOSPITAL. (188 Beds.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædic and traumatic surgery) (recognised by the Royal College of Surgeons) which is now vacant. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience, nationality, and names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

CARSHALTON. QUEEN MARY'S HOSPITAL FOR CHILDREN. (550 Beds.) SURGICAL AND ORTHOPÆDIC REGISTRAR required for duties which include shared Registrar responsibility for 120 orthopædic beds and 60 acute and general beds. Applicants are invited to visit the Hospital by appointment with the Physician-Superintendent.

Applications, which should be made on forms obtainable from the Group Secretary, should be returned by 28th December, 1957.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (A general children's hospital of 550 Beds.) HOUSE SURGEON (House Officer), resident, required for 6 months (3 months general surgery and 3 months E.N.T. and orthopædics). Recognised for D.C.H. Applicants must have completed 12 months' pre-registration service.

Applications, stating age and qualifications, together with 1 recent testimonial and the names of 2 referees, should be submitted to the Group Secretary immediately.

CHELMSFORD AND ESSEX HOSPITAL. (161 Beds.) Applications are invited for the post of RESIDENT HOUSE PHYSICIAN, pre-registration post, to work in the general medical wards of the Hospital. Duties will commence mid-December.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD AND ESSEX HOSPITAL. (161 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON. Pre-registration post. The post offers good surgical experience. Recognised for the F.R.C.S.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. Resident SURGICAL OFFICER (Senior House Officer grade). Duties commence 1st January, 1958. The appointment is recognised for training for the Fellowship of the Royal College of Surgeons, and the successful candidate will gain excellent experience in General Surgery, with good opportunity for preparation for higher qualifications. A House Surgeon is in residence.

Applications, stating age, nationality, qualifications and experience, together with recent testimonials, to be received not later than 10th December, by the Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) Applications are invited for the appointment of HOUSE PHYSICIAN (pre- or post-registration) vacant January, 1958.

Applications, with the names of 2 referees, to be sent to Secretary, General Hospital, Cheltenham.

CHELTENHAM GENERAL HOSPITAL. (220 Beds.) HOUSE SURGEON required (pre- or post-registration) 1st January, 1958. The post offers a wide experience in general surgery, gynæcology, and orthopædic surgery. Post recognised for the F.R.C.S.

Applications, with names of 2 referees, to be sent to Secretary, General Hospital, Cheltenham.

CHERTSEY. ST. PETER'S HOSPITAL (late Botleys Park War Hospital). Locum HOUSE SURGEON (resident) required from 1st January, 1958, to 31st January, 1958.

Applications to Physician-Superintendent, St. Peter's Hospital, giving names and addresses of referees.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) SENIOR HOUSE SURGEON (Deputy Resident Surgical Officer) required at above Hospital. Post recognised for F.R.C.S. Resident staff of 6—Resident Surgical Officer, 3 House Surgeons, Resident Medical Officer, and House Physician. Salary £819 10s. p.a., less residential charge. Vacant 28th December, 1957.

Applications, stating age, experience, qualifications, with references or names of referees, to Senior Administrative Officer.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Clacton and District Hospital, Clacton-on-Sea, Essex (58 Beds)

Post of SENIOR HOUSE OFFICER (Resident Surgical Officer). Post tenable for 1 year.

Black Notley Hospital, Braintree, Essex (516 Beds)

Post of HOUSE SURGEON. First, second, third or pre-registration post. Includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S. Tenable for 6 months.

Essex County Hospital, Colchester (19 gynæcological beds), **Colchester Maternity Hospital** (22 obstetric beds)

Post of HOUSE OFFICER (Male or Female) (obstetric and gynæcological). First, second, third or pre-registration post, tenable for 6 months.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Group Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Guest Hospital, Dudley (154 Beds)

HOUSE OFFICER (medical), pre-registration. Post vacant 1st January, 1958.

Apply Group Secretary, Guest Hospital, Dudley, Worcs.

SENIOR HOUSE OFFICER (anæsthetics). Post recognised for D.A. Successful candidate will be required to visit other hospitals in the Group.

Applications, giving the names of 2 referees, to the Group Secretary, Guest Hospital, Dudley, Worcs.

SENIOR HOUSE OFFICER (surgical). Post vacant now.

HOUSE OFFICER (surgical), pre-registration. Post vacant now.

Apply Group Secretary, Guest Hospital, Dudley, Worcs.

The Corbett Hospital, Stourbridge (114 Beds)

HOUSE OFFICER (surgical), pre-registration. Post vacant January, 1958.

Apply Group Secretary, Guest Hospital, Dudley, Worcs.

Wordsley Hospital, near Stourbridge (478 Beds)

HOUSE OFFICER (medical), pre-registration. Post vacant 27th January, 1958.

Apply Group Secretary, Guest Hospital, Dudley.

DURHAM. COUNTY HOSPITAL. (116 Beds.) Senior HOUSE OFFICER in Orthopædics required immediately. Resident. The County Hospital is the main Orthopædic and Accident Hospital in a busy mining and industrial area. Experience can be obtained in all branches of orthopædics.

Applications, with particulars of previous experience and names of 2 referees, to Group Secretary, Dryburn Hospital, Durham.

DURHAM. COUNTY HOSPITAL. (116 Beds.) Resident HOUSE SURGEON required in Orthopædics and Casualty. Post recognised for pre-registration purposes. This post offers facilities for good and varied experience in a busy orthopædic and accident hospital which serves a wide mining and industrial area.

Apply, giving age, experience and names of 2 referees, to the Group Secretary, Dryburn Hospital, Durham.

DERBY. DERBYSHIRE CHILDREN'S HOSPITAL. HOUSE SURGEON (pre-registration) or SENIOR HOUSE OFFICER required to commence 8th January, 1958. Post recognised for D.C.H.

Applications, stating full particulars, with names of 2 referees, to be sent as soon as possible to Secretary.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds. Recognised for the F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT/NON-RESIDENT REGISTRAR (ophthalmology) required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 16th December, 1957, giving age, nationality, qualifications, present and previous appointments with date, naming 3 referees.

DERBY. DERBYSHIRE ROYAL INFIRMARY. (416 Beds.) SENIOR HOUSE OFFICER (orthopædic). Vacant 1st January. Recognised for 6 months' "unspecified" training for F.R.C.S.

Apply, giving full details and 2 names for reference, to Secretary.

EAST GRINSTEAD. QUEEN VICTORIA HOSPITAL. RESIDENT HOUSE OFFICER (Male or Female) required on 1st January, 1958, for General Hospital. Appointment for 6 months in first instance. Recognised for pre-registration purposes, and for F.R.C.S. examination.

Apply, stating age, experience, with names of 3 referees, to Hospital Secretary.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. RESIDENT HOUSE PHYSICIAN. Approved pre-registration appointment. Vacant early January, 1958. General medical duties. 6 months' appointment.

Applications, with the names and addresses of 2 referees, or copies of 2 recent testimonials, to Group Secretary, Enfield Group Hospital Management Committee, Chase Farm Hospital.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 28th January for Orthopædic, E.N.T., and Eye Departments. Pre-registration post recognised for F.R.C.S.

Applications, stating age, qualifications and experience, with copies of 2 recent testimonials, should be sent as soon as possible to Group Secretary at above address.

EPPING. ST. MARGARET'S HOSPITAL. Senior House OFFICER (pathology). Post vacant 1st January, 1958. Busy department in large general hospital with easy access to London.

Applications, with names of 2 referees, to the Group Secretary, Epping Group Hospital Management Committee, "Oak Cottage," The Plain, Epping, Essex, by 11th December, 1957.

EPPING. ST. MARGARET'S HOSPITAL. Senior House OFFICER (medicine), resident post, duties to commence 15th January, 1958. Duties mainly general medical, experience in pædiatrics desirable.

Applications, with copies of 2 recent testimonials, to reach Group Secretary, Epping Group Hospital Management Committee, "Oak Cottage," The Plain, Epping, Essex, by 13th December, 1957.

EPPING. ST. MARGARET'S HOSPITAL. (424 Beds.) SENIOR HOUSE OFFICER (chest diseases and casualty) required for Tuberculosis Wards in busy general hospital. 40 chest diseases beds run in conjunction with clinic within the grounds. Good experience. Modern methods of treatment. Candidate required to devote one-third of time to casualty duties. Appointment vacant 2nd February, 1958—locum appointment available for preceding fortnight.

Applications, with copies of 2 recent testimonials, to be sent to the Group Secretary, Epping Group Hospital Management Committee, "Oak Cottage," The Plain, Epping, Essex, by 18th December, 1957.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. Applications are invited from registered medical practitioners (Male and Female) for the appointment of SENIOR HOUSE OFFICER in Clinical Pathology (resident). Vacant now. The successful candidate will be responsible for emergency pathological and blood-transfusion duties, and will receive training in the different branches of clinical pathology.

Applications, with names of 2 referees, to the Hospital Secretary.

GLASGOW. THE EXECUTIVE COUNCIL FOR THE CITY OF GLASGOW AND THE BOARD OF MANAGEMENT FOR GLASGOW VICTORIA HOSPITALS. Applications are invited for 2 joint appointments as Part-time Trainee GENERAL PRACTITIONER and Part-time SENIOR HOUSE OFFICER in General Medicine at the Victoria Infirmary. The appointments will be for 2 years and the successful applicants will spend part of each day in the general medical work of the Victoria Infirmary and part as a Trainee General Practitioner with a selected principal. The salary for the posts will be £819 10s. for the first year and £850 for the second year. A car allowance may be payable in addition.

Applications, with names of 2 referees, should be sent to the Secretary and Treasurer, Board of Management for Glasgow Victoria Hospitals, 24, St. Vincent-place, Glasgow, C.1, forthwith.

GRANTHAM AND KESTEVEN GENERAL HOSPITAL. (118 Beds.) RESIDENT HOUSE PHYSICIAN (Senior House Officer or pre-registration intern). General medical and pædiatric. Post vacant 1st February, 1958.

Applications, with full details and names of 2 referees, to Secretary, 101, Manthorpe-road, Grantham.

GUILDFORD. ROYAL SURREY COUNTY HOSPITAL. (233 Beds.) SENIOR HOUSE OFFICER for Anæsthetics required. The holder can be resident or non-resident. Post is vacant on 1st January, 1958, and is recognised for the F.F.A.R.C.S. and includes some work at St. Luke's Hospital. Operations in main theatres totalled 4386 in 1956.

Apply, with full details of experience and copies of 3 testimonials, to the Hospital Secretary.

HASLEMERE AND DISTRICT HOSPITAL. (82 Beds.) GUILDFORD GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (surgical, with charge of 12 acute medical beds). Duties to commence 1st January, 1958. Valuable experience in general and emergency surgery, orthopædic, E.N.T., gynæcological, children and casualty work.

Applications to Hospital Secretary, Haslemere and District Hospital, Haslemere, Surrey, immediately with names of 3 referees.

HALIFAX. NORTHOWRAM HALL HOSPITAL. (108 Beds.) SENIOR HOUSE OFFICER in Chest Diseases required. Post vacant December, 1957. Duties include attendance at busy Chest Clinic at the Royal Halifax Infirmary and non-tuberculosis chest ward work. This post offers excellent facilities for a study of chest diseases and experience is available with bronchoscopies and bronchograms. Salary £819 10s. p.a., with a deduction of £150 p.a. for board residence, &c.

Applications to be forwarded to the Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. House SURGEON for General Surgery required. Post vacant 10th December, 1957.

Applications to the Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. Senior HOUSE OFFICER in Anæsthetics required. Post recognised for D.A. Salary £819 10s. p.a. less £150 p.a. for board-residence.

Applications to be forwarded to the Group Secretary, Royal Halifax Infirmary, Halifax.

HASTINGS AND ST. LEONARDS-ON-SEA. BUCHANAN HOSPITAL. (91 Beds.) (Obstetric, Gynæcological and Premature Baby Unit.) SENIOR HOUSE OFFICER required for Obstetric and Premature Baby Unit. Appointment, recognised for D.Obst.R.C.O.G., is vacant 17th January, 1958.

Apply, giving names and addresses of 3 referees, to Hospital Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) Applications are invited for the post of HOUSE SURGEON (pre-registration), vacant now. This Hospital is the main surgical hospital in the Hastings area and the post offers excellent experience.

Apply immediately, with 2 testimonials or names of 2 referees, to the Administrator of the Hospital.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. HOUSE SURGEON (pre-registration) required.

Applications, giving full details and 2 names for reference, should be sent to the Hospital Secretary as soon as possible.

HEMEL HEMPSTEAD, HERTFORDSHIRE. ST. PAUL'S HOSPITAL. HOUSE PHYSICIAN (pre-registration) required, commencing date 15th January.

Applications to the Hospital Secretary, together with 2 copies of testimonials.

HENLEY-ON-THAMES, OXFORDSHIRE. PEPPARD CHEST HOSPITAL. (236 Beds.) READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of JUNIOR HOSPITAL MEDICAL OFFICER. The Hospital deals with all types of chest disease in medical and surgical wards. Previous experience in resident hospital appointments is desirable. Single accommodation is available.

Applications, stating age, qualifications and experience, with the names of 2 referees, should be forwarded to the Group Secretary, Reading and District Hospital Management Committee, 3, Craven-road, Reading.

HERTFORD COUNTY HOSPITAL. (171 Beds—Hospital situated 21 miles from London.) Applications are invited for the undermentioned appointments :—

HOUSE SURGEON (general), first or second post, to commence as soon as possible.

HOUSE SURGEON (general, gynæcology and obstetrics), first or second post, to commence 13th December, 1957, or as soon after that date as possible

Pre-registration posts ; recognised under F.R.C.S. regulations.

Applications to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HEXHAM GENERAL HOSPITAL, Northumberland. (304 Beds.) HOUSE SURGEONS (2) (general surgery, combined with orthopædics). Pre-registration posts. Applications will be considered from final-year students in anticipation of graduation and also from registered practitioners. Hospital recognised by Royal College of Surgeons. Large orthopædic unit providing excellent experience.

Applications, with names of 2 referees, to Group Secretary, General Hospital, Hexham, Northumberland.

HILLINGDON HOSPITAL, Uxbridge, Middlesex. (621 Beds.) 3 HOUSE SURGEONS required in General Surgery (general and traumatic, general and gastroenterology, and general and genito-urinary). All posts recognised for F.R.C.S. and for pre-registration service.

Apply, together with copies of 3 recent testimonials, to Medical Director by 12th December.

HUDDERSFIELD. ST. LUKE'S HOSPITAL. (235 Beds.) Applications are invited for the post of RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer grade) at the above Hospital, to commence duties immediately. The Group Geriatric Admission Unit is based on this Hospital, which also caters for acute medical and surgical, pædiatric and maternity patients. Salary in accordance with the terms and conditions of service for hospital medical and dental staff, £852 10s.–£55–£1182 10s. p.a. House available for married candidate.

Applications, together with copies of 3 recent testimonials, to be sent to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

ISLE OF WIGHT GROUP HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (resident) required as House Surgeon and to assist Casualty Officer. Salary £819 10s. p.a.

Applications, with names of 2 referees, to Hospital Secretary, Royal I.W. County Hospital, Ryde, by 14th December.

IPSWICH AND EAST SUFFOLK HOSPITAL (Heath-ROAD WING), IPSWICH. (280 Beds.) Post of HOUSE PHYSICIAN (pre-registration) now vacant.

Applications, stating qualifications, age, nationality, &c., with copies of 3 recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL (Heath-road WING), IPSWICH. (280 Beds.) Applications invited for 2 posts of HOUSE SURGEON, pre-registration, to general surgeons. Posts become vacant on 7th and 17th January, 1958, and are recognised for F.R.C.S. examination.

Detailed applications, with copies of recent testimonials, to Hospital Secretary.

IPSWICH. FOXHALL HOSPITAL. (102 Beds for chest diseases.) SENIOR HOUSE OFFICER. The Hospital is actively engaged in the investigation and treatment of all forms of chest disease, including major thoracic surgery and a respiratory function unit. House available.

Applications, with copies of recent testimonials, to Physician-Superintendent, from whom further details may be obtained.

HULL. KINGSTON GENERAL HOSPITAL. (419 Beds.) HULL 'A' GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT JUNIOR HOUSE SURGEON (recognised for the F.R.C.S. examinations; pre- or post-registration). Busy acute general surgical unit.

Applications, with 2 recent testimonials, to the Hospital Secretary.

KEIGHLEY AND DISTRICT VICTORIA HOSPITAL, KEIGHLEY, YORKS. (General—139 Beds.) RESIDENT HOUSE SURGEON (either sex). General surgery and E.N.T., vacant now. Recognised for F.R.C.S. and approved pre-registration appointment, tenable for 6 months in first instance. 4 residents on staff.

Applications, with full particulars as to age, nationality and qualifications, and copies of 2 testimonials, to Group Secretary, St. John's Hospital, Fell-lane, Keighley, Yorks.

KETTERING. ST. MARY'S HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in obstetrics and gynæcology at above Hospital, vacant early January, 1958. Previous experience is not necessary and the post would provide valuable experience in obstetrics and gynæcology for doctors intending to enter general practice at some future date.

Applications, giving particulars of qualifications and enclosing copies of 3 recent testimonials, should be sent to the Group Secretary, Kettering and District Hospital Management Committee, General Hospital, Kettering.

LEEDS REGIONAL HOSPITAL BOARD. Short-term LOCUM TENENS appointments in the Registrar grade are constantly available at hospitals in the area of the Board, particularly in the specialties of anæsthetics, general medicine, general and orthopædic surgery, and psychiatry.

Interested practitioners, suitably experienced, should communicate with the Secretary, Joint Registrars Committee, Park-parade, Harrogate.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Infectious Diseases

Leeds Road Hospital, Bradford (120 infectious diseases beds). Resident.

General/Orthopædic Surgery

(i) Halifax Group (195 general surgical and 85 orthopædic beds). May include some duties in the Casualty Department. Preferably resident.

(ii) York A and Tadcaster Group. Resident or non-resident. Duties mainly at York County and City Hospitals. Aggregate of 110 general surgical and 70 orthopædic surgery beds. Duties divided between general and orthopædic surgery, may include some duties in the Casualty Department.

Orthopædic Surgery

Marguerite Hepton Memorial Orthopædic Hospital, Thorpe Arch, near Wetherby (78 long stay children's beds). A 3-bedroomed partly furnished house is available in the hospital grounds.

General Surgery

Victoria Hospital, Keighley (35 surgical beds). Recognised for F.R.C.S. May include some duties in the Casualty Department.

General Medicine

Halifax Group (110 general medical beds) (380 geriatric beds). Duties divided equally between general medicine and geriatrics. Non-resident.

Anæsthetics

Duties in Leeds A and B Groups. Recognised for F.F.A.R.C.S. and D.A. Resident.

Rheumatism Research

The Leeds Regional Hospital Board, in association with the University of Leeds, invites applications for the post of Registrar in Rheumatism, to assist the Professor of Clinical Medicine with research projects at the Royal Bath Hospital, Harrogate, which is the centre for the Regional Rheumatism Scheme, or elsewhere in the Region.

Thoracic Surgery

Regional Thoracic Centre, Pinderfields General Hospital, Wakefield (56 Beds). Recognised for F.R.C.S.

Applications, stating age (sex in the case of Registrar in Rheumatism Research), qualifications and details of present and previous appointments, with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 11th December, 1957.

LEEDS. THE UNITED LEEDS HOSPITALS. THE GENERAL INFIRMARY AT LEEDS. RESIDENT ORTHOPÆDIC OFFICER required of Senior House Officer status. The post will initially be for 6 months from 1st February, 1958, and will be renewable for a further period of 6 months thereafter. Terms and conditions of service for hospital medical staff apply.

Applications, stating age, qualifications, previous posts with dates, to be sent to the Secretary to the Board by not later than 20th December, 1957.

LIVERPOOL, 20. BOOTLE HOSPITAL. Applications are invited for a post as HOUSE SURGEON. The post will be vacant from 11th January, 1958, and is recognised for pre-registration service.

Apply to Secretary, Walton Hospital, Liverpool, 9.

LIVERPOOL, 15. SEFTON GENERAL HOSPITAL. (995 Beds, 116 Cots.) Applications are invited for the following resident appointments which will become vacant at the above-named Hospital on 1st March, 1958, and will be for a period of 6 months. These posts are approved as pre-registration posts :—

6 HOUSE PHYSICIANS (general).
2 HOUSE PHYSICIANS (psychiatric).
3 HOUSE SURGEONS (general).
2 HOUSE SURGEONS (obstetric).
1 HOUSE PHYSICIAN (tropical).

The terms and conditions of service will be in accordance with the regulations of the Ministry of Health.

Application forms may be obtained from the undersigned, to whom they should be returned as soon as possible.

GARNET CHAPLIN, Secretary,
South Liverpool Hospital Management Committee.

LANCASTER MOOR HOSPITAL, Lancaster. (Regional MENTAL HOSPITAL.) Applications are invited for the post of resident JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female). Accommodation for a single medical officer but accommodation may possibly be available early in 1958 for a married applicant. Hospital recognised for D.P.M. and facilities granted for attending neighbouring universities. All modern methods of investigation and treatment carried out. Hospital serving North Lancashire and Lake District. Post for initial period of 4 years, but renewable if services satisfactory.

Apply Medical Superintendent.

LEICESTER ROYAL INFIRMARY. Applications are invited for the resident post of SENIOR HOUSE OFFICER to the E.N.T. Department, for a period of 12 months commencing 1st January. The post is recognised for the D.L.O. and F.R.C.S.

Applications, stating age, qualifications and experience, together with copies of recent testimonials, to the Group Secretary, No. 1 Hospital Management Committee, The Leicester Royal Infirmary, forthwith.

LEICESTER ROYAL INFIRMARY. Sheffield Regional HOSPITAL BOARD. Whole-time NON-RESIDENT SENIOR HOUSE OFFICER or REGISTRAR in Radiotherapy required 6th February. (Possession of a higher qualification in medicine or surgery or the D.M.R.(T.) Part I would qualify for appointment of Registrar.) Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 16th December, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LEICESTER ROYAL INFIRMARY (492 Beds) and GENERAL HOSPITAL (454 Beds). SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (orthopædics) required. Appointment for 1 year in first instance, Leicester General Hospital (72 orthopædic beds), Leicester Royal Infirmary (54 orthopædic beds).

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 16th December, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LEICESTER. TOWERS MENTAL HOSPITAL. (1168 Beds.) Applications are invited for the whole-time post of JUNIOR HOSPITAL MEDICAL OFFICER. Salary £852 10s.–£55–£1182 10s. There is ample opportunity for experience in all branches of psychiatry including outpatient work and the Hospital is recognised for D.P.M. experience. Facilities for post-graduate training exist at Sheffield University. Resident accommodation is available for a single man, for which the appropriate charge will be made. Candidates must have completed their service with H.M. Forces.

Applications, giving age, nationality, and full details, with the names of 2 referees, to be sent to the Medical Superintendent as soon as possible.

LINCOLN COUNTY HOSPITAL. (200 Beds.) Applications are invited from pre-registration candidates for appointments as HOUSE SURGEONS in January and February, 1958, for 6 months, to be followed, if satisfactory, by appointment as House Physician for a further 6 months.

Full particulars should be forwarded to :—

R. W. HOWICK, Group Secretary,
Lincoln No. 1 Hospital Management Committee.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE PHYSICIAN. 6 months' appointment. Post vacant mid-January, 1958. Salary at the rate of £467 10s.–£577 10s. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration post of HOUSE SURGEON. 6 months' appointment. Post vacant mid-January, 1958. Salary at the rate of £467 10s.–£577 10s. A deduction at the rate of £125 a year is made for board and lodging, and other services provided.

Applications should be forwarded, as soon as possible, to the Administrative Officer at the Hospital.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. Salary £819 10s. p.a. less £150 p.a. for board and lodging. Post vacant February, 1958.

Applications to the Administrative Officer at the Hospital.

MAIDENHEAD HOSPITAL, Berkshire. Applications invited for post of CASUALTY OFFICER (Senior House Officer grade), vacant 30th December. Post recognised for F.R.C.S.

Applications, stating age, qualifications, experience and nationality, with copies of testimonials or names of 3 referees, to Secretary.

MAIDENHEAD HOSPITAL, Berkshire. Applications invited for post of HOUSE SURGEON vacant 15th December. Pre-registration post.

Applications, stating age, qualifications and nationality, with names of 3 referees, to Secretary.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. RESIDENT SURGICAL REGISTRAR required.

Application forms from and returnable to Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 14th December.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. The Board invite applications from registered practitioners for the post of RESIDENT SURGICAL OFFICER (Registrar grade) at the Christie Hospital and Holt Radium Institute. The post provides unique experience in the treatment of tumours and good opportunity for study.

Applications, with full details including the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, immediately.

MANCHESTER REGIONAL HOSPITAL BOARD. Blackburn AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT REGISTRAR (obstetrics/gynæcology) required 1st February, 1958. Post recognised for Membership and D.Obst.R.C.O.G. (combined obstetrics and gynæcology). Based on Queen's Park Hospital, Blackburn, a large busy hospital with 58 obstetric and 29 gynæcology beds. Duties also at Royal Infirmary, Blackburn, and Victoria Hospital, Accrington.

Application forms available from and returnable to the Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

MANCHESTER REGIONAL HOSPITAL BOARD. North AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR (Chest Diseases) required to carry out duties arranged by the Consultant Chest Physician at the Altrincham, Northwich, Crewe Chest Clinics and Hefferston Grange Sanatorium. Accommodation might be arranged, if necessary.

Applications, together with 2 recent testimonials, should be sent to the Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER REGIONAL HOSPITAL BOARD. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. BAGULEY HOSPITAL. (402 Beds.) The Board invite applications for the post of REGISTRAR or SENIOR HOUSE OFFICER in Chest Diseases. This Hospital is a large thoracic unit fully equipped for the medical and surgical treatment of tuberculosis and other chest diseases. Attached to the Hospital is a chest clinic. The post offers opportunities for wide experience in medical and surgical treatment of patients suffering from tuberculosis and other diseases of the chest, together with chest clinic work. Ample scope for clinical research.

Applications, stating age, qualifications, nationality, experience and the names of 2 referees, to be forwarded to the Group Secretary, Withington Hospital, Manchester, 20, within 7 days of appearance of this advertisement.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General hospital—433 Beds.) Following posts vacant on 15th January, 1958 :—

2 HOUSE OFFICERS (general surgery). Recognised for F.R.C.S. examination.
2 HOUSE OFFICERS (general medicine).
All pre-registration posts.

Application forms from Group Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General hospital—433 Beds.) HOUSE OFFICERS (obstetrics) required. Pre-registration posts, vacant mid-January. Recognised for M.R.C.O.G. examination.

Application forms from Group Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General hospital—433 Beds.) SENIOR HOUSE OFFICER (anæsthetics) required. Post vacant early December. Hospital recognised for training for Diploma in Anæsthetics.

Application forms from Group Secretary.

MANCHESTER, 20. GROUP PATHOLOGY LABORATORY, WITHINGTON HOSPITAL. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT PATHOLOGIST (Senior House Officer grade). Vacant now. Tenable for 12 months. Previous experience in pathology not essential, the post affording opportunities for gaining experience in all branches of clinical pathology. Laboratory recognised for the Dip. Path.

Applications, stating age, qualifications, present post, experience and the names of 2 referees, to be forwarded to the Group Secretary immediately.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (surgical) including casualty duties. Vacant immediately. The post is recognised by the Royal College of Surgeons for the final F.R.C.S. examination, and possession of the primary F.R.C.S. will be an advantage. The Hospital is recognised by the University of Manchester for the teaching of undergraduate students.

Applications, with full details, to the Group Secretary immediately.

MANCHESTER, 23. WYTHENSHAWE HOSPITAL. SOUTH MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in Plastic Surgery. Vacant 1st February, 1958. This is the only House Officer post for a Plastic Surgery Unit of 71 Beds where the candidate appointed will spend most of his time, but in addition there are some general surgical duties.

Applications, with the names of 2 referees, to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the pre-registration appointments of 5 HOUSE SURGEONS, each for a period of 6 months, falling vacant in January, 1958. The Hospital participates in the teaching of students in the Surgical and Obstetrical Departments, and posts are recognised by the Royal Colleges.

Applications, stating age, qualifications, appointment(s) held, and the names of 2 referees, should be sent to the Administrative Officer without delay.

MITCHAM. WILSON HOSPITAL, Cranmer-road, MITCHAM, SURREY. RESIDENT HOUSE PHYSICIAN (not pre-registration). Vacant now.

Applications, stating age, qualifications, &c., with the names and addresses of 2 referees, to the Secretary at above address.

MOORFIELDS EYE HOSPITAL (City Road Branch), London, E.C.1. Applications are invited for the post of SIXTH HOUSE SURGEON (Registrar) (non-resident). The appointment is for a period of 4 months from 1st March, 1958, and the holder of the post at the completion of that time will be eligible for appointment as Fifth, Fourth, Third, Second Resident Surgical Officer and subsequently as Senior Resident Officer, for similar periods.

Applications should be submitted on the official form obtainable from the undersigned, stating age and qualifications, together with testimonials and photograph, and be received not later than 20th December, 1957.

J. P. HEMING, House Governor.

NEWCASTLE REGIONAL HOSPITAL BOARD. Registrar THORACIC SURGEON, whole-time, resident, at Regional Thoracic Centre (150 Beds) Shotley Bridge General Hospital (work almost entirely non-tuberculosis, cardiovascular, œsophageal and pulmonary) and at associated sanatoria. Applicants must have good experience in general surgery and have a higher qualification or its equivalent. Appointment intended either for trainee in thoracic surgery or general surgeon seeking special experience. Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Registrar OBSTETRICIAN AND GYNÆCOLOGIST, whole-time, Tees-side Group of hospitals—main hospital, Middlesbrough Maternity (80 Beds). Post affords good obstetrical and gynæcological experience. Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Registrar PHYSICIAN, whole-time, 1 year only, Cardiovascular Unit, Newcastle General Hospital. Excellent experience afforded. Post available from 1st February, 1958. Single accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Registrar SURGEON, whole-time, for Surgical Clinic No. 1 Newcastle General Hospital (738 Beds). Accommodation available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield Road, Newcastle upon Tyne, 6, within 7 days.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. ROYAL VICTORIA INFIRMARY. Applications are invited for the non-resident appointment of SENIOR HOUSE OFFICER in the Department of Bacteriology at the above Hospital. The successful applicant will assist in the general work of the laboratory, including blood-transfusion serology. Previous laboratory experience is not essential. The appointment will be for 1 year and will be subject to terms and conditions of service of hospital medical staff in the National Health Service.

Applications, giving full details and the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne, 1.

NEWCASTLE. THE UNITED NEWCASTLE UPON TYNE HOSPITALS. ROYAL VICTORIA INFIRMARY. Applications are invited for the non-resident appointment of REGISTRAR in the Department of Bacteriology at the above Hospital. The successful applicant will assist in the general work of the laboratory, including blood-transfusion serology and in the research programme.

Applications, stating date of birth, qualifications, and experience, together with the names and addresses of 3 referees, should be sent to the undersigned within 2 weeks of the appearance of this advertisement.

A. W. SANDERSON, House Governor and Secretary.
Royal Victoria Infirmary, Newcastle upon Tyne, 1.

NORTHWOOD, MIDDLESEX. MOUNT VERNON HOSPITAL. Applications are invited for Whole-time SURGICAL REGISTRAR from end of February, 1958. Required for 1 year in the first instance. Appointment recognised for the final F.R.C.S. examination. Candidates may visit the Hospital by direct appointment with the Resident Medical Officer.

Application forms obtainable from and returnable to the Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 28th December, 1957.

NOTTINGHAM GENERAL HOSPITAL. 2 Senior House OFFICERS (orthopædic and fracture) required (January and February, 1958). Post offers exceptional experience in traumatic surgery.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM. GENERAL HOSPITAL. Senior House OFFICER (medical) required on 25th January, 1958.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Resident pre-registration HOUSE PHYSICIANS required. 2 31st December, 1957; 1 21st January, 1958.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Resident pre-registration HOUSE SURGEONS required, 1st January, 31st January, 4th February, 5th February.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM CITY HOSPITAL. (611 Beds.) Applications are invited for the post of RESIDENT PATHOLOGIST (Senior House Officer). Previous experience an advantage. Post vacant 16th January, 1958.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM CITY HOSPITAL. (611 Beds.) Applications are invited for the post of HOUSE OFFICER (obstetrics and gynecology, recognised for pre-registration purposes), which will be graded Senior House Officer or House Officer in accordance with experience. Recognised for the M.R.C.O.G. and D.Obst.R.C.O.G. Post vacant 16th January, 1958.

Applications, stating age, nationality, qualifications and experience, together with copies of not more than 3 testimonials, to be sent to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

NOTTINGHAM. HIGHBURY HOSPITAL, Bulwell, NOTTINGHAM. SENIOR HOUSE OFFICER (surgical) required at the above Hospital. Good opportunity for obtaining experience in all types of general surgery. Vacancy with effect, 1st December, 1957.

Applications, stating age, qualifications, experience and nationality, together with copies of testimonials, to be sent to Hospital Secretary.

NORTHAMPTON GENERAL HOSPITAL. (500 Beds.) Vacancy 1st February, 1958, for SENIOR HOUSE OFFICER, E.N.T. Department. Recognised for F.R.C.S. and for D.L.O. Appointment to 30th September, 1958, in first instance.

Applications as soon as possible to S. G. HILL, Superintendent.

NUNEATON. GEORGE ELIOT HOSPITAL. House OFFICER in Pædiatrics. Recognised pre-registration and D.C.H.

Applications to Hospital Secretary.

OXFORD REGIONAL HOSPITAL BOARD. UNITED OXFORD HOSPITALS. SENIOR REGISTRAR in Pathology to Stoke Mandeville Hospital. This is a central clinical laboratory serving Stoke Mandeville and the Aylesbury hospitals and acting as parent to High Wycombe and Amersham laboratories. It is closely connected with research projects being undertaken at Stoke Mandeville Hospital. Under an exchange scheme, the second half of the appointment may be undertaken in the Pathology Department of the United Oxford Hospitals. Appointment for 1 year in the first instance, eligible for extension up to 4 years. Applicants may visit Stoke Mandeville Hospital by arrangement with the Pathologist.

Applications on forms obtainable from the Secretary, Joint Committee for Senior Registrars (from whom further particulars may be obtained), 43, Banbury-road, Oxford, should be received by him by 21st December.

OXFORD REGIONAL HOSPITAL BOARD. Senior REGISTRAR in Psychiatry at the Warneford Hospital, Oxford. Appointment for 1 year in the first instance. Applicants should hold the D.P.M.

Applications, on forms obtainable from the Secretary, Joint Committee for Senior Registrars, 43, Banbury-road, Oxford, to reach him by 16th December.

OXFORD. UNITED OXFORD HOSPITALS. Senior REGISTRAR in Chest Diseases to the hospitals and clinics of the United Oxford Hospitals. Appointment for 1 year in the first instance. Previous experience in chest diseases and higher qualification in general medicine desirable.

Applications, on forms obtainable from the Joint Secretary to the Committee, 43, Banbury-road, Oxford, should reach him by 14th December.

OXFORD. UNITED OXFORD HOSPITALS. The Rad-CLIFFE INFIRMARY. Applications are invited for the post of REGISTRAR/RESEARCH ASSISTANT to the Accident Service to commence as soon as possible. The duties of this post will be divided equally between the clinical duties of the Registrar appointment, and research work in the Department, under the supervision of the Director of the Accident Service.

Applications, on forms obtainable from the Administrator, Radcliffe Infirmary, Oxford, should be received as soon as possible.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL. Vacancies exist in the following department:—

SENIOR HOUSE OFFICER in Surgery, vacant 17th February, 1958. Recognised for the F.R.C.S.

HOUSE SURGEONS (pre-registration posts), vacancies 9th December, 1957, 1st and 4th January, 1958. Recognised for the F.R.C.S. Greenbank Road Hospital.

In all cases send names of 3 referees to the Group Secretary, 7, Nelson-gardens, Stoke, Plymouth.

POOLE GENERAL HOSPITAL, Poole. (310 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (pre-registration) required immediately.

Applications to Hospital Secretary.

PETERBOROUGH. THE MEMORIAL HOSPITAL and OBSTETRIC ANNEXES. PETERBOROUGH AND STAMFORD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (obstetrics and gynæcology). Applications are invited for vacancy on 28th January, 1958. Busy Gynæcological Department and 54 obstetric beds. Unit consists of a Consultant, Registrar, and 2 House Surgeons. Recognised for D.Obst.R.C.O.G.

Application forms from Secretary.

PETERBOROUGH. MEMORIAL HOSPITAL. Peter-BOROUGH AND STAMFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of HOUSE PHYSICIAN, vacant on 15th January, 1958. The appointment will be for 6 months.

Applications, with testimonials, should be addressed to the Secretary, Memorial Hospital, Peterborough.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

(1) **Saint Mary's Hospital**

Applications are invited for the appointment of SENIOR HOUSE OFFICER (medical), vacant 9th December, 1957. Duties will be mainly in the acute medical wards and outpatients, but there will be some duties in the Geriatric Assessment Unit of 76 Beds. The appointment affords an opportunity of seeking large numbers of acute cases and is an excellent one for those studying for a higher medical qualification.

(2) **Royal Portsmouth Hospital**

(*a*) **Orthopædic Department** (104 beds)

(i) SENIOR HOUSE OFFICER required. Vacant now.

(ii) HOUSE OFFICER (pre-registration). Vacant now.

(*b*) SENIOR HOUSE SURGEON (70 surgical beds). Vacant now.

(3) **Queen Alexandra Hospital**

(*a*) SENIOR HOUSE SURGEON (87 surgical beds). Vacant 1st January, 1958.

(*b*) HOUSE PHYSICIAN (pre-registration) (78 medical beds). Vacant 1st January, 1958.

Applications, stating age, experience and qualifications, together with the names of two referees, should be forwarded as soon as possible to E. H. HURST.

St. Mary's Hospital, Milton-road, Portsmouth.

READING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER for E.N.T. Department, Royal Berkshire Hospital, Reading (40 Beds). Post recognised for D.L.O.

Applications, stating age, nationality, experience and qualifications, together with names of 2 referees, should be sent to Group Secretary, 3, Craven-road, Reading.

ROCHFORD, ESSEX. GENERAL HOSPITAL. (620 Beds.) Applications are required from pre-registration candidates for a 6-month appointment of HOUSE SURGEON (recognised for F.R.C.S.) at the above Hospital. Post now vacant.

Applications, &c. (1 testimonial only necessary from pre-registration candidates seeking first appointment), to be sent immediately to J. C. FIELD, Secretary.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. Resi-DENT PATHOLOGIST (Senior House Officer grade). This post, which will become vacant in the New Year, provides valuable experience by rotation through all departments of this large Group Laboratory and is recognised for the purposes of the Diploma in Pathology. Prospective candidates are invited to visit the Laboratory.

Applications should be sent, with testimonials or the names of 2 referees, as soon as possible to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. (301 Beds.) RESIDENT HOUSE OFFICER (general surgery) required from 7th January, 1958. Post is recognised for Pre-registration purposes and for F.R.C.S.

Applications should be forwarded immediately to Medical Superintendent stating also names of 2 referees.

RYDE. ROYAL I.W. COUNTY HOSPITAL. Isle of Wight GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. CASUALTY AND ORTHOPÆDIC OFFICER required end January, 1958, at the above Hospital, either as Registrar (£935–£1061 10s.) or as Junior Hospital Medical Officer (£852 10s.–£55–£1183 10s.). The appointment is resident, married or single accommodation being available.

Forms of application may be obtained from the Group Secretary, Hospital Management Committee, Clatterford House, Carisbrooke, I.W., and should be returned not later than 21st December.

RYDE, I.W. ROYAL ISLE OF WIGHT COUNTY HOS-PITAL. (116 Beds.) HOUSE SURGEON (pre-registration post and recognised for F.R.C.S.), vacant late January.

Applications, with names of 2 referees, to Hospital Secretary not later than 14th December, 1957.

SALFORD ROYAL HOSPITAL. Salford Hospital Man-AGEMENT COMMITTEE. The following pre-registration HOUSE SURGEON posts will fall vacant on 21st January, 1958.

General Surgery.
General Surgery and Gynæcology.
E.N.T. and Neurosurgery.
Casualty.
Urology.

Applications, stating age and qualifications, together with copies of 2 testimonials, should be addressed to the Secretary, Salford Royal Hospital, Chapel-street, Salford, 3.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON (recognised by R.C.O.G.)/HOUSE SURGEON for a period of 6 months in each post commencing with House Surgeon post. The posts are open to pre-registration candidates.

Apply immediately, giving names and addresses of 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Psychiatry. The duties in the first instance will be within the Rosslynlee and Haddington Mental Hospitals (over 600 Beds). Facilities for further training and study will be available in association with the University Department of Psychological Medicine.

Apply, giving details of experience, qualifications and age, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 28th December, 1957.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Radiodiagnosis to the Edinburgh Northern Group of Hospitals, vacant on 24th February, 1958.

Apply, giving particulars of age, qualifications and previous experience, and the names of 3 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 28th December, 1957.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Radiodiagnosis at the Royal Infirmary of Edinburgh, vacant on 6th March, 1958. The work will include periods of duty at other hospitals in the region.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 28th December, 1957.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

REGISTRAR in Medicine based at the Victoria Infirmary, Glasgow.

REGISTRAR in Pathology based at the Victoria Infirmary, Glasgow.

REGISTRAR in Obstetrics and Gynæcology for duties at Robroyston Hospital and at the Royal Samaritan Hospital for Women, Glasgow, and on a yearly rotational basis at Greenock Royal Infirmary and Rankin Memorial Hospital, Greenock. Experience in general surgery will also be available at Greenock Royal Infirmary. The post at Robroyston Hospital is recognised for the M.R.C.O.G.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, by 21st December, 1957.

SHEFFIELD, 6. KING EDWARD VII ORTHOPÆDIC HOSPITAL. SHEFFIELD NO. 3 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of a SENIOR HOUSE OFFICER. The Hospital has 154 Beds, 100 of which are occupied by children. It is a modern unit for the treatment of poliomyelitis and has close contact with a nearby infectious diseases hospital. The post would suit applicants interested in children's diseases, as there is a fair amount of general medical work.

Applications, with names of 2 referees, to Group Secretary, Sheffield No. 3 Hospital Management Committee, Lodge Moor Hospital, Sheffield, 10.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications invited for the post of ANÆSTHETIC REGISTRAR. The successful candidate will be required to work in any of the units of the United Sheffield Hospitals.

Applications, with the names of 3 referees, should be sent not later than 17th December, 1957, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. SENIOR REGISTRAR in Psychiatry required to work under the Consultant Psychiatrist and Professor of Psychiatry in the newly established Psychiatric Department. D.P.M. essential. There will be opportunities for research.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 14th December, 1957, to the Chief Administrative Officer, United Sheffield Hospitals, West-street, Sheffield, 1.

SHREWSBURY. CROSS HOUSES HOSPITAL. Obstetric HOUSE SURGEON. Pre-registration post. Vacant mid-January.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SKIPTON (near). GRASSINGTON HOSPITAL. (206 Beds.) SENIOR HOUSE OFFICER required for the above Hospital, which provides treatment for tuberculous patients, men and women. Accommodation available for single applicants.

Application to Medical Superintendent.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. LOCUM HOUSE PHYSICIAN required 30th December–12th January.

Applications to Secretary with names of 2 referees.

SOUTHAMPTON EYE HOSPITAL. (32 Beds. Recognised for D.O. Examination.) RESIDENT SENIOR HOUSE OFFICER required end December.

Applications, with copies of testimonials, should be forwarded as soon as possible to Secretary, Southampton Group Hospital Management Committee, Bullar-street.

SOUTHAMPTON GENERAL HOSPITAL. (474 Beds.) RESIDENT HOUSE SURGEONS (2) required. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (274 Beds. Recognised for F.R.C.S.) ORTHOPÆDIC HOUSE SURGEON (post recognised for pre-registration service and tenable for 6 months). The Hospital is the centre to which all trauma from a large industrial town and port is directed, thus providing excellent experience in the treatment of traumatic conditions; patients with orthopædic conditions are drawn from a wide area.

Applications, with copies of testimonials, should be sent as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) for the Anæsthetic Department of the Southampton Group of hospitals. Special facilities for working for F.F.A. R.C.S. and D.A.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (274 Beds.) RESIDENT HOUSE SURGEON required. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in General Surgery to fill a vacancy in the approved trainee establishment at the Canterbury, and Isle of Thanet Groups of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staff (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 21st December, 1957.

SOUTH ELMSALL. WARDE-ALDAM HOSPITAL. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Senior House Officer grade). Warde-Aldam Hospital is a general hospital of 39 Beds (general and orthopædic surgery and E.N.T.). Furnished flat available. Duties mainly in Casualty Department.

Applications, giving details of qualifications and previous experience, with names of 2 referees, to be forwarded to the undersigned as soon as possible.

D. G. DAVIES, Secretary,
Pontefract and Castleford Hospital Management Committee.
Great Northern House, Salter-row, Pontefract.

SOUTHPORT GENERAL INFIRMARY. (189 Beds. Recognised for pre-registration and F.R.C.S.)

HOUSE PHYSICIAN, General Medicine.
HOUSE PHYSICIAN, General Medicine and Ophthalmology.
HOUSE SURGEON, General Surgery.
HOUSE SURGEON, General Surgery and Gynæcology.

Appointments vacant early January.

Apply, stating age, qualifications, nationality, experience, post required and enclosing 2 copy testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. The following Resident House Officer posts become vacant on 1st March, 1958 :—

St. Helens Hospital (196 Beds)
HOUSE PHYSICIAN.
HOUSE SURGEONS (2),

Whiston Hospital, Prescot (892 Beds)
HOUSE PHYSICIANS (3).
HOUSE PHYSICIAN (pædiatric).
HOUSE SURGEONS (2).
HOUSE SURGEON (obstetrics).

The above posts are recognised for pre-registration service. The surgical posts are recognised for the F.R.C.S. examinations, and the pædiatric post is recognised for the D.C.H. examination.

Applications, stating age, date of qualification and experience, and giving 2 names for reference, should be forwarded to the Group Secretary, Whiston Hospital, Prescot, immediately. Please state for which post application is made.

ST. ALBANS (near), HERTFORDSHIRE. SHENLEY HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Psychiatry. Possession of the D.P.M. or higher medical qualification essential. Preference will be given to an applicant of wide training in psychiatry who requires further experience before applying for consultant post. Unfurnished house available at a moderate rental for a married candidate. Hospital may be visited by appointment.

Application forms obtainable from and returnable to Secretary, Shenley Hospital Management Committee, by 31st December, 1957.

ST. ALBANS, HERTFORDSHIRE. CELL BARNES HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required at above Hospital. This is a modern hospital where 895 mental defectives of all types and ages are under care. Approved for D.P.M. A good pædiatric experience available. Hospital may be visited by direct appointment.

Application forms obtainable from the Group Secretary, Harperbury Hospital, St. Albans, Hertfordshire, and returnable by 14th December, 1957.

ST. ALBANS CITY HOSPITAL. (384 Beds.) North West METROPOLITAN REGIONAL HOSPITAL BOARD. MEDICAL REGISTRAR required for 1 of the 2 acute medical teams at above Hospital, from 12th February, 1958. Post suitable M.R.C.P. training. Hospital may be visited by direct appointment.

Application forms obtainable from and returnable to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, by 14th December, 1957.

ST. ALBANS CITY HOSPITAL. (384 Beds.) North West METROPOLITAN REGIONAL HOSPITAL BOARD. CASUALTY OFFICER (Registrar grade) required. Post recognised for F.R.C.S. regulations. Appointment tenable for 6 months from early January, 1958, and subject to review at end of this period.

Application forms obtainable from and returnable to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, Herts, by 17th December, 1957.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE PHYSICIAN (House Officer grade) required for 1 of the 2 medical teams. Post vacant 21st December, 1957, and tenable for 6 months. Preference given to candidates seeking post under the Medical Act, 1950.

Applications to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE SURGEON (House Officer grade) required for 1 of the 2 surgical teams from 19th December, 1957. Post recognised for F.R.C.S. Preference given to candidates seeking post under the Medical Act, 1950.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (pædiatrics) required. Post vacant 14th January. Pre-registration. Hospital recognised for D.C.H.

Detailed applications, with copy testimonials, to Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE ON TRENT. CITY GENERAL HOSPITAL. HOUSE PHYSICIAN required. Pre-registration post vacant mid-January.

Detailed applications, with copy testimonials, to Secretary at the Hospital.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE PHYSICIAN required (pre-registration). Post vacant early January.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. HOUSE OFFICER (general surgery) required. Recognised for F.R.C.S. 2 posts vacant early January.

Detailed applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. SENIOR HOUSE OFFICER (E.N.T.) required. Recognised F.R.C.S. and D.L.O.

Detailed applications, with copy testimonials to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOCKPORT AND BUXTON HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following pre-registration posts :—

Stockport Infirmary (163 Beds)

HOUSE OFFICER (surgery), vacant 31st January, 1958. Recognised for the F.R.C.S. and D.L.O.

Stepping Hill Hospital (529 Beds)

HOUSE OFFICER (medicine), vacant 27th January, 1958.
HOUSE OFFICER (medicine), vacant 21st February, 1958.
HOUSE OFFICER (obstetrics), vacant 1st March, 1958. Recognised for the D.Obst. R.C.O.G.

Applications, with full particulars and copies of 2 testimonials, to the Group Secretary, 59B, Shaw Heath, Stockport.

STOCKPORT INFIRMARY, Stockport. (163 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Assistant Resident Surgical Officer) (general and orthopædics), vacant 10th January, 1958. The post is recognised for the F.R.C.S.

Applications, stating age, experience and qualifications, together with copies of 2 testimonials, to be addressed to the Secretary, Stockport and Buxton Hospital Management Committee, 59B, Shaw-heath, Stockport.

STRATFORD-ON-AVON GENERAL HOSPITAL. (163 Beds.) SENIOR HOUSE OFFICER (Resident Medical Officer) required. Post vacant January, 1958. Duties on medical wards under supervision of Consultant Staff. Appointment gives good experience in general medicine and is suitable for one working for a higher qualification. 2 other resident staff.

Applications, giving qualifications and experience, together with copies of 2 testimonials, to Hospital Secretary.

SUNDERLAND. ROYAL INFIRMARY, Durham-road, SUNDERLAND. (300 Beds.) HOUSE OFFICER or SENIOR HOUSE OFFICER (Male) according to experience, required for duties in gynæcology and urological units. Post vacant 24th December. Provisionally registered practitioners may apply.

Apply to Hospital Secretary, giving the names and addresses of 2 referees.

SWANSEA. MORRISTON HOSPITAL. (501 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER in the Pediatric Unit of the above Hospital. The post is recognised for the D.C.H.

Applications, with full particulars and copies of 2 recent testimonials, should be sent to the Medical Superintendent of the Hospital. T. E. JONES, Group Secretary.

SWANSEA. MOUNT PLEASANT HOSPITAL. (236 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of SENIOR HOUSE OFFICER in Obstetrics for the maternity unit of 40 Beds at the above Hospital. The post, which will become vacant on 12th February, 1958, is for a period of 12 months, and is recognised for the D.Obst.R.C.O.G. examination.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, should be sent to the Hospital Secretary not later than 31st December, 1957.

T. E. JONES, Group Secretary.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SWINDON HOSPITALS. Applications invited for post of RESIDENT HOUSE PHYSICIAN in acute medical unit of 64 Beds at St. Margaret's Hospital. Recognised for training under pre-registration internship regulations and vacant on 17th December, 1957.

Full details, with names of 3 referees, to Secretary, 7, Okus-road, Swindon, immediately.

STOCKTON-ON-TEES. STOCKTON AND THORNABY HOSPITAL. TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER in the Casualty Department at the above-named Hospital, which is in the charge of a Senior Casualty Officer. The post, which is vacant shortly, is recognised for the F.R.C.S. examination, and time for study is available.

Applications, stating full details and giving names of 2 referees, should be addressed to the Hospital Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for post vacant 3rd January. Pre-registration post.

Applications, stating age, qualifications with dates, and copies of 2 testimonials, to Secretary.

TAUNTON AND SOMERSET HOSPITAL, Taunton, SOMERSET. (423 Beds.) HOUSE OFFICER (general surgery) required. Pre-registration post recognised for F.R.C.S.

Applications, stating age, nationality, and qualifications to the Group Secretary, Taunton Hospital Management Committee, c/o Musgrove Park Hospital, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for SENIOR HOUSE OFFICER (Resident Surgical Officer). Post vacant early February, 1958. This is a post giving excellent experience in surgery including operating work according to qualifications and experience. The post is recognised by the Royal College of Surgeons as a qualifying appointment for the Final Fellowship Examination.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TAUNTON AND SOMERSET HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER (casualty and orthopædic), post vacant mid-January, 1958.

Applications, stating age, nationality and qualifications, together with the names of 2 referees, should be forwarded to the Group Secretary, Taunton Hospital Management Committee, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TEES-SIDE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (anæsthetics) with the above-named Group of hospitals. Main duties at North Ormesby and Eston Hospitals. Post recognised for D.A. and F.F.A. R.C.S. Some experience in anæsthetics an advantage though not essential.

Applications, with copies of 3 testimonials, to the Group Secretary, Tees-side Hospital Management Committee, North Ormesby Hospital, Middlesbrough, within 14 days.

TORQUAY. TORBAY HOSPITAL. (166 general beds.) RESIDENT HOUSE OFFICER (surgical), Male or Female, required approximately 15th December, 1957. Post recognised for F.R.C.S. and pre-registration purposes. There is a complement of 6 Resident House Officers.

Applications, stating qualifications, nationality and age, together with copy testimonials (quoting reference F.955/84), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TORQUAY. TORBAY HOSPITAL. (166 acute general beds.) HOUSE OFFICER (medicine), Male or Female, required early January 1958. Pre-registration appointment. General duties which will include some work in the E.N.T., the Ophthalmic and Radiotherapy Departments.

Applications, stating qualifications, nationality, age, together with copy testimonials (quoting ref. F.955/85) to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TORQUAY. TORBAY HOSPITAL. Resident Casualty OFFICER (Senior House Officer status) required approximately 23rd December, 1957. There is a complement of 6 Resident House Officers.

Applications, stating qualifications, nationality, age (quoting ref. F.955/86), with copy testimonials, to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TREDEGAR GENERAL HOSPITAL, MONMOUTHSHIRE. RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SURGICAL OFFICER (Senior House Officer or Junior Hospital Medical Officer grade according to experience) required for Surgical Unit at above Hospital. Duties are those of Assistant to General Surgeon; staff, includes House Surgeon. Commodious family flat.

Apply, with full particulars and stating names of 2 referees, to Secretary.

WALLINGFORD (near), BERKSHIRE. FAIR MILE HOSPITAL. BERKSHIRE MENTAL HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the appointment of JUNIOR HOSPITAL MEDICAL OFFICER at above mental Hospital of 1053 Beds. The post provides an excellent opportunity for postgraduate training in psychiatry, including outpatient clinic work and every facility is provided for study for the D.P.M. Residential accommodation for a married man will shortly become available. The appointment is subject to the terms and conditions of service for hospital medical staff. The salary is £852 10s.–£55–£1182 10s.

Applications, including details of age, qualifications and experience, together with names of 2 referees, should be forwarded to the Medical Superintendent, Fair Mile Hospital, near Wallingford, Berks, within 10 days of the appearance of this advertisement.

WARWICK HOSPITAL. (320 Beds.) House Surgeon. Pre-registration or registered candidates may apply. Good experience in general surgery. Vacant 25th January, 1958. Married quarters available.

Applications, with 2 testimonials, to be forwarded to the Medical Superintendent.

WARWICK HOSPITAL. (320 Beds.) Pædiatric House PHYSICIAN, resident, required in January. 30-bedded pædiatric unit. Post recognised D.C.H. and pre-registration.

Applications, with 2 recent testimonials, to Medical Superintendent.

WARWICK HOSPITAL. (320 Beds.) House Physician. Post recognised pre-registration, resident, vacant 25th January, 1958.

Applications, with 2 testimonials, to be forwarded to Medical Superintendent.

WARWICK, near. CENTRAL MENTAL HOSPITAL. (1400 Beds.) SENIOR HOUSE OFFICER. Neurosis unit, adult and child psychiatry clinics, departments of electroencephalography, occupational therapy, psychology and social work. Recognised for D.P.M. Flat available.

Applications, with names and addresses of 3 referees, to Medical Superintendent within 14 days.

WALSALL HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following appointments :—

Manor Hospital (340 Beds)

HOUSE SURGEON.
HOUSE PHYSICIAN.
PÆDIATRIC HOUSE PHYSICIAN required, 1st February, 1958. Recognised for D.C.H.

General Hospital (181 Beds)

HOUSE SURGEON.
HOUSE PHYSICIAN.

All posts recognised for pre-registration.

Applications, together with names of 2 referees, to Group Secretary, Walsall General (Sister Dora) Hospital.

WELSH REGIONAL HOSPITAL BOARD.

REGISTRAR (general medicine), Bridgend General Hospital, Bridgend (381 Beds). Hospital recognised for major diplomas. Resident/non-resident.

SURGICAL REGISTRAR (orthopædics) at Prince of Wales Orthopædic Hospital, Rhydlafar (280 Beds) serving Cardiff Hospital Management Committee. Hospital is Regional Orthopædic Centre for South Wales area. Married accommodation available.

Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WELSH REGIONAL HOSPITAL BOARD. Surgical REGISTRAR (plastic surgery), St. Lawrence Hospital, Chepstow (177 Beds). Expected to visit other hospitals in South Wales area. Considerable opportunities for training in specialty. Accommodation for single person. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WELSH REGIONAL HOSPITAL BOARD. Registrar (psychiatry), Morgannwg Hospital, Bridgend (all modern treatments, active outpatient clinics). Child Guidance Clinic and Psychological Department. Within easy reach of University of Wales. Accommodation available. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WEST BROMWICH AND DISTRICT HOSPITALS MANAGEMENT COMMITTEE. Applications are invited for the following appointments. Pre-registration.

West Bromwich and District General Hospital (144 Beds)

1 HOUSE PHYSICIAN.
1 HOUSE SURGEON.

Hallam Hospital (430 Beds)

2 HOUSE PHYSICIANS.
2 HOUSE SURGEONS.
2 HOUSE OFFICERS (obstetrics and gynæcology).

These posts will be vacant 8th January, 1958.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WESTON-SUPER-MARE GENERAL HOSPITAL. (107 Beds.) Applications are invited from registered medical practitioners for the pre-registration appointment (resident) of HOUSE PHYSICIAN, vacant 1st February, 1958.

Applications, stating age, qualifications, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WESTON-SUPER-MARE GENERAL HOSPITAL. (107 Beds.) Applications are invited from registered medical practitioners for the pre-registration appointment (resident) of HOUSE SURGEON, vacant 1st February, 1958.

Applications, stating age, qualifications, together with names and addresses of 2 referees, should be addressed to the Secretary, Weston-super-Mare Hospital Management Committee.

WORTHING HOSPITAL, Lyndhurst-road, Worthing, SUSSEX. Applications are invited from registered medical practitioners for the appointment of SURGICAL OFFICER (Senior House Officer grade). The post is recognised for the revised Fellowship regulations in respect of the 6 months' training required by candidates for the Final Fellowship examination.

Applications, stating age, qualifications, nationality and experience, together with copies of 2 recent testimonials, to be forwarded to the Hospital Secretary as soon as possible.

A. V. OAKTON, Group Secretary.

Worthing Group Hospital Management Committee.

WIGAN AND LEIGH HOSPITAL MANAGEMENT COMMITTEE. BILLINGE HOSPITAL, near WIGAN. SENIOR HOUSE OFFICER in Psychiatry. The post offers good experience under Consultant Psychiatrist. Main centre at Billinge Hospital where there is an active psychiatric unit with modern treatment and over 300 admissions annually.

Applications, with names of 2 referees, to Secretary, Knowsley House, Wigan.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. SENIOR HOUSE OFFICER in Medicine and Pædiatrics. Post vacant 1st January, 1957.

Applications to Secretary, Royal Albert Edward Infirmary, Wigan.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. (200 Beds.) SENIOR HOUSE OFFICER in Orthopædic Surgery. Post vacant 1st January, 1957.

Applications to Secretary.

WOODFORD GREEN, ESSEX. HARTS HOSPITAL. (100 Beds.) SENIOR HOUSE OFFICER required, post vacant 12th January, 1958. The Hospital is a modern sanatorium with Area Chest Clinic. The post offers exceptional opportunities for gaining experience in tuberculosis and diseases of the chest. Accommodation for single person only. Salary £819 10s. p.a., less £150 p.a. for board, lodging, &c.

Applications, with copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

WORCESTER ROYAL INFIRMARY. (213 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER in Medicine (Resident Medical Officer), vacant early January. The post is of 1 year's duration and besides acute medicine the post covers some work in infectious diseases and geriatrics.

Applications, with copies of 3 recent testimonials, to be sent to the Secretary.

WORKSOP. VICTORIA HOSPITAL. (119 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required 1st February. Duties also at Kilton Hospital, Worksop (185 Beds). There are 76 acute surgical beds at these hospitals and the post offers broad training in general surgery, E.N.T., orthopædic and traumatic surgery. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 16th December, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

CANADA. KINGSTON GENERAL HOSPITAL, Kingston, ONTARIO. Canadian Teaching Hospital of Queen's University offers approved rotating INTERNESHIPS for 12 months commencing 1st July, 1958. Vigorous interne training programme. Opportunities for further appointments to more senior clinical posts and to research fellowships. Honorarium $100 per month plus full residential emoluments.

Apply Superintendent.

MICHIGAN, U.S.A. OAKWOOD HOSPITAL, Dearborn, MICHIGAN. Applications are invited for 1 or 2-year approved GENERAL PRACTICE RESIDENCY in modern 234-Bed General Hospital 10 miles from Detroit. Excellent facilities. Hospital approved for exchange-visitor programme. Beginning monthly salary $250 if single, $300 if married. Free housing.

Apply: Director.

Public Appointments

LONDON COUNTY COUNCIL. Applications are invited from registered medical practitioners for appointment as ASSISTANT PRINCIPAL MEDICAL OFFICER in the Public Health Department. Inclusive salary £1530–£50–£1680–£55–£1790 ; no emoluments. Principal duties in the first instance connected with the Housing Acts with particular reference to slum clearance.

Application forms from the Medical Officer of Health (PH/DI/B/2190), The County Hall, S.E.1, returnable by 20th December, 1957.

NEWCASTLE. CITY AND COUNTY OF NEWCASTLE UPON TYNE. Applications are invited from registered medical practitioners for the appointment of ASSISTANT MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER. The possession of a Diploma in Public Health is not necessary but will be an advantage. The general conditions of service will be in accordance with the recommendations of the Whitley Council for the Health Services (Great Britain), Medical Council "C", and the salary range will be from £1050 to £1475 p.a. Duties will be carried out in the School Health and Child Welfare Services. For those not in possession of the Diploma in Public Health an opportunity will be afforded to take the part-time course in the University of Durham.

Further particulars may be obtained from the Medical Officer of Health, Health Department, Town Hall, Newcastle upon Tyne, to whom application must be forwarded not later than 16th December. JOHN ATKINSON, Town Clerk.

Town Hall, Newcastle upon Tyne, 1. December, 1957.

NORTHUMBERLAND. COUNTY OF NORTHUMBERLAND. Joint appointment of AREA EXECUTIVE MEDICAL OFFICER for the South East Area and MEDICAL OFFICER OF HEALTH for the Borough of Whitley Bay and the Urban Districts of Longbenton and Seaton Valley. Applications are invited from registered medical practitioners for the joint appointment of Area Executive Medical Officer for the South East Area and Medical Officer of Health for the Borough of Whitley Bay and the Urban Districts of Longbenton and Seaton Valley. The salary for the joint appointment will commence at £1928 15s., rising by 4 annual increments of £65 and 1 of £25 to £2213 15s., plus a travelling allowance in respect of a motorcar not exceeding 12 h.p. The person appointed will be required to give his, or her, whole time to the duties of the joint appointment and must not engage directly or indirectly in private practice. The appointment is subject to the provisions of the Local Government Superannuation Acts, to the national conditions of service, and to 3 months' notice in writing on either side, and the successful candidate will be required to pass a medical examination.

Application forms and further particulars may be obtained from the Clerk of the County Council, County Hall, Newcastle upon Tyne, 1, to whom applications must be submitted not later than 23rd December, 1957.

DERBYSHIRE COUNTY COUNCIL. Appointment of ASSISTANT COUNTY MEDICAL OFFICER OF HEALTH for the Derbyshire County Council and MEDICAL OFFICER OF HEALTH for Buxton Borough, Whaley Bridge Urban District and Chapel-en-le-Frith Rural District. Applications are invited from Male or Female registered medical practitioners holding a Diploma in Public Health or an equivalent qualification for the above mentioned permanent "mixed" appointment. The total inclusive annual salary will be £1785 0s. 1d.–£57 14s. 6d. (3)–£60 (1)–£25 (4)–£2118 3s. 7d. p.a. The person appointed will be directly responsible to each District Council for the proper performance of all the duties of a Medical Officer of Health for the respective areas. As Assistant County Medical Officer he will be concerned, under the direction of the County Medical Officer of Health, with decentralised supervision required under the National Health Service, as well as work in connection with the School Health Service, attendance at clinics, and such other duties as may be required. The Officer will be required to live in the area of the District Councils. Sympathetic consideration will be given to the provision of temporary housing accommodation, if required. The Officer must not engage in private practice, and must devote whole-time service to the duties of the before-mentioned posts. The appointment is subject to the provisions of the Local Government Superannuation Acts, 1937–53, and the successful candidate will be required to pass a medical examination. Canvassing, either directly or indirectly, will be a disqualification.

Application forms may be obtained from the County Medical Officer, County Offices, St. Mary's Gate, Derby. Completed forms should be sent to the Town Clerk, Town Hall, Buxton, so that they are received not later than 21st December, 1957.

GREAT YARMOUTH. COUNTY BOROUGH OF GREAT YARMOUTH. DEPUTY MEDICAL OFFICER OF HEALTH/SCHOOL MEDICAL OFFICER/DEPUTY PORT MEDICAL OFFICER. Applications are invited from registered medical practitioners, holding a qualification in public health, for the above superannuable appointment. Candidates should have had experience in general public and school health work and be capable of assuming full responsibility for the Health Department in the absence of the Medical Officer of Health. Experience in infectious diseases and the ascertainment of educationally subnormal pupils will be considered additional qualifications. The salary will be within the scale £1266 p.a. rising by annual increments of £55 to a maximum of £1596, plus a car allowance which at present is at the rate of £180 p.a. The appointment may be terminated by 3 months' notice on either side. Housing accommodation will be made available by the Council, if required.

Further details regarding the appointment and the submission of applications may be obtained from the undersigned, by whom applications should be received not later than 28th December, 1957. FARRA CONWAY, Town Clerk.

Town Hall, Great Yarmouth.

LANCASHIRE COUNTY COUNCIL. Applications are invited from registered medical practitioners for appointment as ASSISTANT DIVISIONAL MEDICAL OFFICERS in the vicinities of Preston and Liverpool. Possession of Diploma in Public Health desirable. Salary £1050 rising to £1475 p.a. Travelling and subsistence allowances where applicable.

Application forms and further particulars from County Medical Officer, Serial 600, East Cliff County Offices, Preston. Application forms to be returned by 14th December, 1957.

LUTON. BOROUGH OF LUTON. Assistant Medical OFFICER. Applications are invited for this appointment. Salary scale: £1050–£50–£1200–£55–£1475. Commencing salary within the scale will be commensurate with qualifications and experience. Car allowance payable. Preference will be given to applicants possessing a Diploma in Public Health. Duties will include work in connection with school health services, hospital treatment of infectious diseases, and part III personal health services.

Full particulars and conditions of appointment obtainable from the Medical Officer of Health, Public Health Department, 63/69, Guildford-street, Luton, to whom applications should be delivered by 16th December, 1957.

Town Hall, Luton. A. D. HARVEY, Town Clerk.

COMHAIRLE CONNDAE NA MIDHE. Staff required for the Orthopædic Unit at An Uaimh. The Neath County Council invite applications for the following posts for the Orthopædic Unit at Our Lady's Hospital, An Uaimh :—

Temporary Posts :

1 ANÆSTHETIST for 6 months in the first instance.

1 ORTHOPÆDIC REGISTRAR for 12 months in the first instance.

Rates of remuneration as approved by the Department of Health. This staff is required for the new Orthopædic Unit which will deal with all types of orthopædic surgery from 6 counties and the sitting of an interview board in London will be considered in the case of English applicants.

Completed applications on the prescribed forms, which may be had from the Chief Officer, Health and Assistance Sections, County Clinic, An Uaimh, Eire, must be received not later than 5 P.M. on 20th December, 1957.

THE MEDICAL SERVICE OF THE ROYAL NAVY

VACANCIES FOR MEDICAL OFFICERS

Candidates are invited for Short Service Commissions of 3 years, on termination of which a gratuity of £600 (tax free) is payable. Ample opportunity is granted for transfer to Permanent Commissions on completion of 1 year's total service. Officers so transferred are paid instead a grant of £1500 (taxable).

All entrants are required to be British subjects whose parents are British subjects, medically qualified, physically fit, and to pass an interview.

Full particulars from the Admiralty Medical Department, Queen Anne's Mansions, St. James's Park, London, S.W.1.

NOTTINGHAMSHIRE COUNTY COUNCIL. MANSFIELD BOROUGH COUNCIL. MANSFIELD HOSPITAL MANAGEMENT COMMITTEE. Mixed appointment. Applications are invited from registered medical practitioners for the mixed whole-time appointment of ASSISTANT COUNTY MEDICAL OFFICER AND DEPUTY MEDICAL OFFICER OF HEALTH of the Mansfield Borough Council and ASSISTANT MEDICAL OFFICER, Forest Hospital, Mansfield (Mansfield Hospital Management Committee). Applicants must have had at least 3 years' professional experience since qualifying; be experienced in the duties of Medical Officer of Health, School Medical Officer, and the care of mothers and young children, and possess a diploma in public health.

Salaries will be as follows:—

(*a*) As Assistant County Medical Officer (28/44ths) £763 12s. 9d.–£36 7s. 3d. (3)–£40 (5)–£1072 14s. 6d. p.a. (On scale £1050–£50–(3)–£55 (5)–£1475 p.a. plus loading in accordance with Spens formula.)

(*b*) As Deputy Medical Officer of Health, Mansfield Borough Council (12/44ths) £343 12s. 9d.–£15–£403 12s. 9d. p.a. (On scale £1160–£55 (4)–£1380 plus 12/44ths of £100.)

(*c*) As Assistant Medical Officer, Forest Hospital, Mansfield (4/44ths) £183 15s. p.a.

Application forms and conditions of appointment are obtainable from my office, and applications should reach me by 21st December, 1957. Canvassing disqualifies.

A. R. DAVIS, Clerk of the County Council.

Shire Hall, Nottingham.

OLDHAM. COUNTY BOROUGH OF OLDHAM. Applications are invited from registered medical practitioners for the appointment of ASSISTANT MEDICAL OFFICER OF HEALTH AND ASSISTANT SCHOOL MEDICAL OFFICER, which affords an excellent opportunity for obtaining experience in the Public Health and School Health Services. Salary £1050–£50–£1200–£55–£1475 p.a. The point of entry will be fixed according to qualifications and experience. The appointment is superannuable and subject to medical examination.

Applications, stating age, qualifications, and experience, should be forwarded to the Medical Officer of Health, Public Health Department, Town Hall, Oldham, together with copies of 2 testimonials, or the names of 2 persons to whom reference may be made. EDWARD HAINES, Town Clerk.

PETERBOROUGH. CITY AND SOKE OF PETERBOROUGH. Appointment of CITY MEDICAL OFFICER OF HEALTH AND DEPUTY COUNTY MEDICAL OFFICER. Applications are invited from medical practitioners holding the qualifications required by statutory regulations for full-time service in the mixed appointment of City Medical Officer of Health (5/11ths), Deputy County Medical Officer of Health (3/11ths) and Deputy School Medical Officer under the Peterborough Joint Education Board (3/11ths). Salary £1780–£55–£2000 (M.D.C. scale). Car allowance and other Whitley Council provisions.

Forms of application and further particulars may be obtained from the Town Clerk, P.O. Box No. 8, Town Hall, Peterborough, Northants. Closing date Saturday, 14th December, 1957.

HER MAJESTY'S OVERSEAS SERVICE. Tanganyika. PATHOLOGIST required for general pathological work under direction of Senior Pathologist with likelihood of duties with Police Force. Must possess medical qualifications registrable in United Kingdom and have experience in general pathology and forensic medicine. A higher qualification in bacteriology or pathology is desirable but not essential. Appointment can be made on permanent basis with pension (non-contributory), or on short-term contract with gratuity (taxable) on satisfactory completion of service. National Health Service doctor may retain superannuation rights (up to 6 years) and receive gratuity (taxable) of 20% of aggregate salary after engagement. Salary ranges from £1284 to £2115 a year, starting-point determined by experience. 4 extra increments given for approved higher qualifications. Only permanent officers can be members of Her Majesty's Overseas Civil Service. Quarters generally available at rental of £30–£78 a year according to size and type, furniture £12–£24 a year. Free passages in both directions for officer and wife and-up to cost of 1 adult fare for children. Taxation at local rates. Annual local leave permissible and generous home leave after each tour of from 30 to 36 months. Educational facilities.

Application forms from Director of Recruitment, Colonial Office, Great Smith-street, London, S.W.1 (quoting BCD. 117/8/028).

KENYA. MEDICAL DEPARTMENT. Pre-registration House Officer posts. Applications are invited for appointments as HOUSE OFFICERS at the King George VI Hospital, Nairobi. Appointment will be on agreement for 1 year in the capacity of House Physician and House Surgeon. Applicants must have completed their National Service or not be liable for it. These posts are recognised for pre-registration training by the University of London and certain other licensing bodies, but candidates should confirm from their licensing bodies that these posts are acceptable to them for the purposes of the Medical Act, 1950. Consolidated salary £600 a year for first 6 months and £660 a year for second 6 months. Income-tax at local rates. Residents pay approximately £5 a month towards cost of quarters, servants, conservancy, &c., and £12 10s. a month for messing, which is on communal basis. Married quarters are not provided; married candidates may not be accompanied by their wives. Free passages are provided on appointment and on satisfactory completion of internship. 18 days' local leave a year is granted. If the selected candidate applies for and obtains appointment to the Medical Branch of Her Majesty's Overseas Service in Kenya at the expiration of his internship, previous service as Resident Medical Officer will count for leave but he will be required to serve the usual probationary period. The period of internship will not count for seniority. There is ample opportunity for clinical experience with systematic teaching, and a large measure of personal responsibility under specialist guidance.

Application forms from Director of Recruitment, Colonial Office, London, S.W.1 (quoting BCD. 117/7/03).

TREASURY MEDICAL SERVICE. Applications are invited from medical practitioners, practising in the districts detailed below, for appointment, in a part-time and mainly advisory capacity, as LOCAL TREASURY MEDICAL OFFICER for each of the places or groups of places shown. The town shown in parentheses after the place-names indicates the Head Post Office Area in which the place, or group of places, is situated. Successful applicants will be required to examine and report on the condition of certain Government officers, teachers, candidates for appointment, &c., who may be referred to them from time to time; and to attend when summoned to an emergency case of accident or sudden illness occurring in a Government office in the neighbourhood. Fees for this work, and mileage allowance where necessary, will be paid on a scale agreed with the British Medical Association.

Intending applicants should write, within 14 days, to Treasury Medical Adviser, Treasury Chambers, Whitehall, S.W.1, for a form on which application may be made. Applicants should be not more than 60 years of age.

The places for which applications are invited are as follows :—

England and Wales

Darlington (Darlington).
Mirfield (Dewsbury and Batley).
Conway (Llandudno).
Carlton (Nottingham).
Bedworth (Nuneaton).
Abbeytown and Silloth (Carlisle).
Poynton (Stockport).
Bethesda (Bangor).

Scotland

Clarkston, Busby and Eaglesham (Glasgow).
Dunblane (Stirling).

General Practice

For an ***Executive Council post*** *(England and Wales) apply on form* E.C.16A *obtainable from the council. Mark envelope "Vacancy."*

CURRY RIVEL, near TAUNTON, SOMERSET. Applica-tions are invited from Doctors for a VACANCY caused by death in the above rural practice. List approximately 2500, mainly dispensing patients. Residence and Surgery accommodation—doubtful. Application on Form E.C.16A to reach the Clerk, Somerset Executive Council, 21, Montpelier, Weston-super-Mare, Somerset, by 13th December, 1957.

SOUTH CROYDON (Intermediate Area). Applications are invited for resignation VACANCY in the South Croydon area. List at present approximately 2070. Retiring doctor's residence and surgery may be available for purchase. Apply on form E.C.16A before 21st December, 1957, to the undersigned :—

S. C. SULLIVAN,
Clerk of the Croydon Executive Council.
19, South End, Croydon, Surrey.

ZETLAND EXECUTIVE COUNCIL. Applications are invited from registered medical practitioners to fill the VACANCY in the medical service area of Lerwick and Bressay, Shetland Isles. Persons on list number approximately 1590, and there is a small mileage payment available in the practice. Non-dispensing practice. Residence which includes professional accommodation and 2 garages, is owned by retiring doctor who is leaving area. Form of application and further particulars may be obtained from the Clerk, Zetland Executive Council, Lerwick, with whom applications should be lodged not later than 21st December, 1957.

Miscellaneous

Required, Assistant Medical Officer (preferably under 30 years of age) for large chemical factory in Yorkshire. Exceptional opportunities for young man keen on toxicology and general industrial medical problems. Salary according to qualifications and experience, minimum £1400 p.a. Applications in writing to Staff Department, Imperial Chemical Industries Limited, Dyestuffs Division, Hexagon House, Blackley, Manchester, 9.

Imperial Chemical Industries Limited, Alkali Division, Winnington, Northwich, Cheshire, requires full-time Assistant Medical Officer (Male), under 40 years of age, at their Chemical Works at Northwich. Previous experience in industry desirable. Compulsory pension scheme. Profit-sharing scheme. Housing available. Good commencing salary according to age and experience, to be discussed at interview. Engagement subject to satisfactory medical and X-ray examinations and references.—Write to Staff Manager for official application form.

Australia. Queensland. The Associated Friendly Societies' Medical Institute at Bundaberg, requires services of a Medical Officer. Salary £A1000 p.a., plus free residence. Private practice is allowed, which is estimated to be worth an additional £A1500. —Full particulars obtainable from Agent-General for Queensland, 409, Strand, London.

THE BAHRAIN PETROLEUM COMPANY LIMITED

has a vacancy for a

LABORATORY TECHNICIAN (FEMALE)

in their Hospital at Bahrain, Persian Gulf. Candidates should possess at least Part I I.M.L.T. and have had considerable experience in bacteriological, hematological (including Rh. blood grouping) and bio-chemical investigations.

Commencing basic salary £68 per month. In addition a living allowance is paid together with free air-conditioned quarters, initial kit allowance plus paid leaves, pension and provident fund benefits, &c.

Please apply in writing with full particulars, quoting "MED" to Caltex Services Limited, Caltex House, Knightsbridge-green, London, S.W.1.

Italian-speaking Medical Officer wanted for Rhodesia. A vacancy exists for a Medical Officer to the main civil engineering contractors of the Kariba hydro-electric scheme on the Zambezi River in the Federation of Rhodesia and Nyasaland. The successful applicant must hold the necessary British medical qualifications to enable him to practise in Southern Rhodesia, and must be able to speak Italian fluently as his patients will be the Company's employees, nearly all of whom are Italian and many of whom speak no English. The appointment will be for a period of 2 years, with 25 days p.a. paid leave. Salary will be in accordance with qualifications and experience, between £1800 and £2400 p.a. A furnished house will be provided free of charge. A nominal charge will be made for electricity, while water is free; motor transport will be provided free. The Company will pay the passages of the successful applicant and his family from the United Kingdom to Kariba and back at the end of his contract. There is a fully-equipped Government Hospital with a surgeon and physician in attendance at Kariba.—Applications to The General Manager, Impresit Kariba (Pvt.) Limited, Third Floor, Shepperton House, 90, Cameron-street, Salisbury, Southern Rhodesia.

Principal Medical Officer required by The Assam Rail-ways and Trading Co. Ltd., situated in North East Assam, India, and employing some 6000 persons. The practice also includes the employees of 5 tea gardens. Training in tropical medicine and a fair knowledge of surgery are essential, and experience of hospital administration is desirable. Gross salary, including allowances, is in the range of £3250–£4000 p.a. with free furnished quarters, &c.—Write, giving full particulars, to The Acting Secretary, The Assam Railways and Trading Co. Ltd., Cereal House, 58, Mark-lane, E.C.3.

Applications are invited for the post of Visiting Medical Officer with the Kelantan (Malaya) Planters' Association Medical Service Scheme which will fall vacant in February, 1958. Salary scale $1200–50A–$1300 plus cost-of-living allowance $275 (reviewed quarterly) and travelling expenses. 3-year contract with gratuity of $6000 on satisfactory completion of service.

N.B.—The Malayan dollar equals 2s. 4d. sterling. Free furnished quarters provided. First-class passages to and from Malaya provided.—Applications (by airmail), giving full particulars of qualification, age and experience, should be addressed to Boustead & Co. Ltd., Secretaries, The Kelantan Planters' Association, Kota Bharu, Kelantan, Malaya, to arrive by 31st December, 1957.

Korea. Doctor (Female) required with pædiatric experience; age preferably between 26 and 40. Contract 1 year renewable. Salary £1000 p.a. Maintenance equipment allowances and fares paid. 1 month's holiday per year. Duties in Pusan, Korea.—Apply Foreign Relief Secretary, Save the Children Fund, 12, Upper Belgrave-street, S.W.1. Telephone SLOane 9171.

Bury and Rossendale Hospital Management Committee. For sale, 3 electrocardiographs : Cambridge Portable before 1949; Cossor Direct Writer, October, 1952 : Cambridge Standard, October, 1951. The above are complete with accessories.—Offers to the Group Secretary at Bury General Hospital, Bury, Lancs.

Histologic technicians, experienced. Excellent salary. —Write Congenital Heart Disease Research and Training Center, 629, South Wood-street, Chicago, Ill., U.S.A., giving full details.

"Alfona" is fat-free cow's milk to which has been added vegetable oils containing essential fatty acids suitable for atheroma cases.—Enquiries to ALFONAL, Shell-Mex House, Strand, London, W.C.2. (Telephone COV. 2211.)

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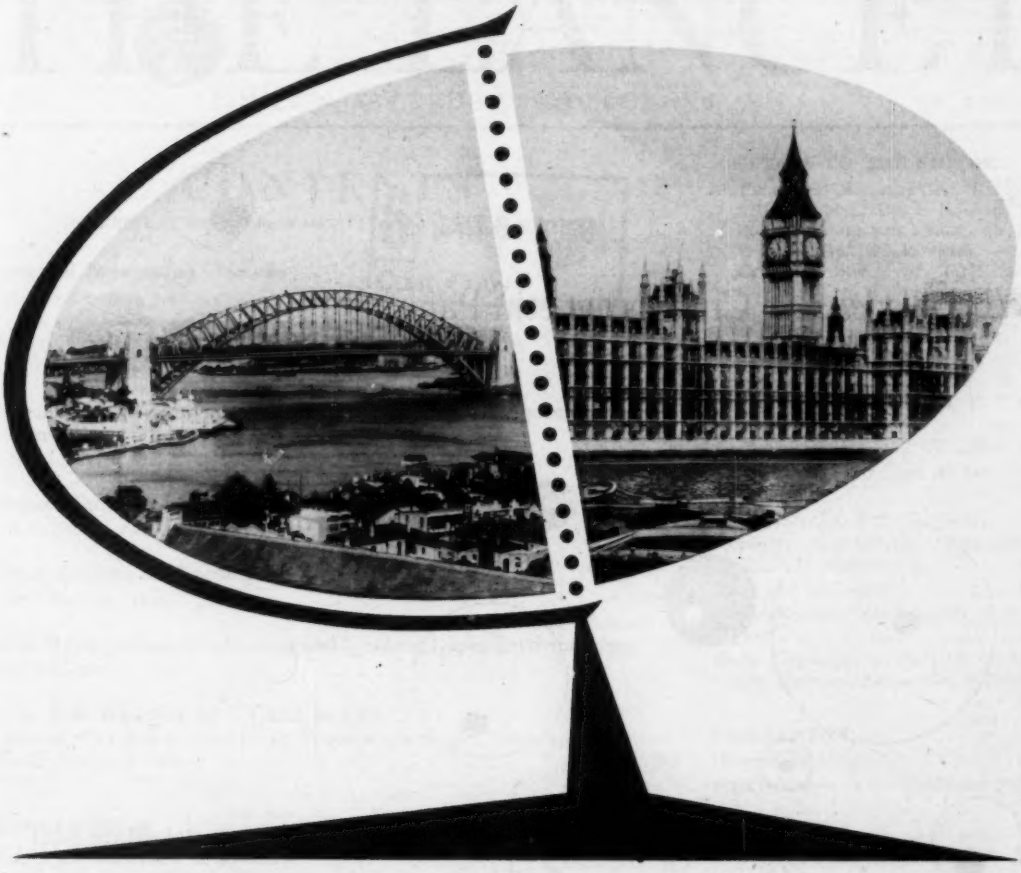

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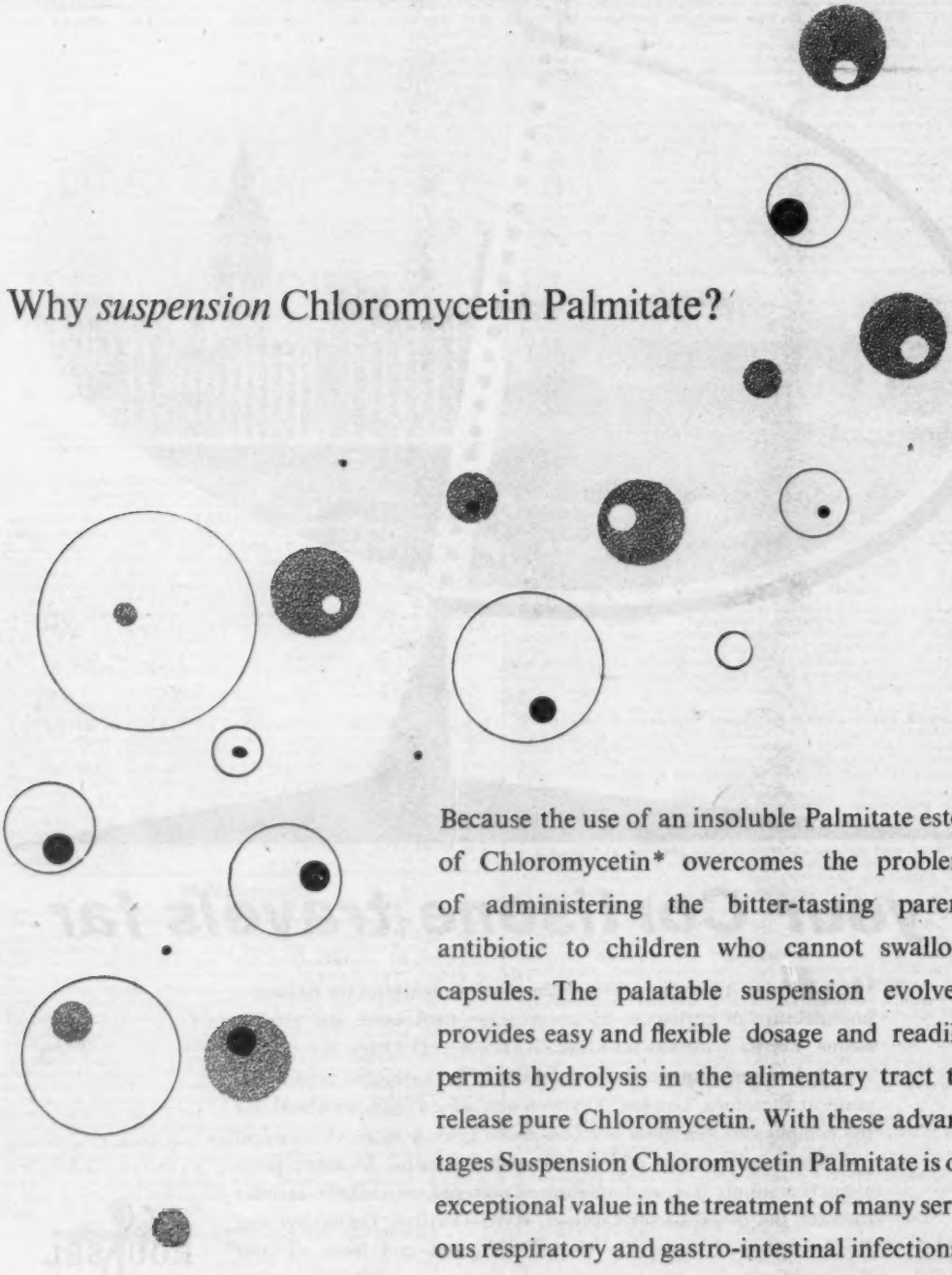

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